

# Amateur Radio

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ARV  
celebrates  
its Centenary



- Coping with HF noise
- Salvaging parts
- Magnetic loop for 20 m



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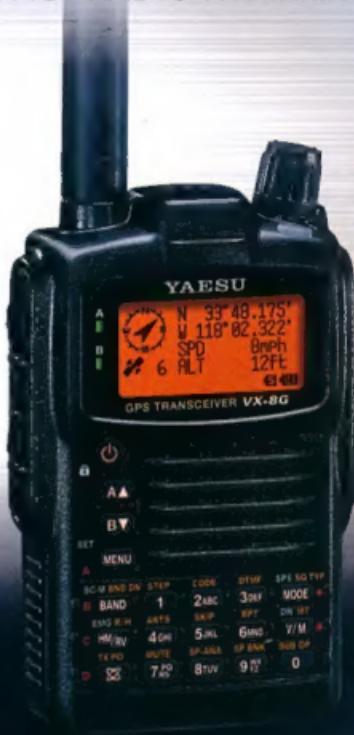


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# Amateur Radio

The Journal of the Wireless Institute of Australia

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Don Jackson VK3DBB  
Evan Jarman VK3ANI  
Bill Roper VK3BR  
Ewen Templeton VK3OW  
Ernie Walls VK3FM  
Greg Williams VK3VT

### All circulation matters

nationaloffice@wia.org.au

### How to submit material

#### Secretary

AR Publications Committee  
PO Box 2042  
BAYSWATER VIC 3153  
or armag@wia.org.au

### Letters to Editor

Editor AR Magazine  
PO Box 273  
Churchill Vic 3842  
or editor@wia.org.au

### Hamads

'Hamads'  
PO Box 2042  
BAYSWATER VIC 3153  
hamads@wia.org.au

### Advertising

All enquiries to  
Advertising Manager  
AR Publications Committee  
PO Box 2042  
BAYSWATER VIC 3153  
or admanager@wia.org.au

### Registered Office

Unit 20 11-13 Havelock Road  
BAYSWATER VIC 3153  
Australia

Phone: 03 9729 0400  
Fax: 03 9729 7325

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This month's cover

*Our cover this month shows Terry Murphy VK3UP in his shack. Terry was very involved in activating the VK100ARV callsign during the ARV Centenary celebrations, both from home and portable in the Brisbane Ranges National Park. The inset photo shows Luke VK3HJ busy with the CW key during one of his sessions using the special callsign. See the story on page 6. Photo by Terry Murphy VK3UP.*

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## Contributions to Amateur Radio



WIA cannot be responsible for loss or damage to any material. Information on house style is available from the Editor.

### Back issues

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### Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

## Wireless Institute of Australia

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Representing

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### Registered Office of the WIA

Unit 20, 11-13 Havelock Road

Bayswater, Victoria, 3153

Tel: (03) 9729 0400 Fax: (03) 9729 7325

email: [nationaloffice@wia.org.au](mailto:nationaloffice@wia.org.au)

<http://www.wia.org.au>

All mail to:

**PO Box 2042 BAYSWATER VIC 3153**

Business hours: 10am – 4pm weekdays

### National Office staff

Manager	Mal Brooks	VK3FDL
Administration Officer	Margaret Williams	
Examination Officer	Dianne Ashton	VK3FDZ

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# Editorial

Peter Freeman VK3PF



## Your magazine (and your WIA)

Some might consider that *Amateur Radio (AR)* is simply the printed face of the WIA. As Editor, I prefer to consider AR to be your magazine.

Why do I take this view? Mainly because AR contains content provided primarily by readers – that means you. Yes, we usually have about four or five pages of material that comes from the WIA, if you include my editorial, plus the Contents and the WIA Directory. That leaves almost 50 pages of other content, which comes from either regular contributors (our columns and club news items) or articles submitted for publication.

There has recently been some discussion on a particular on-line forum regarding the comparative value of WIA versus ARRL membership. The discussion thread started with a simple statement expressing the view that ARRL membership was good value, primarily due to the receipt of QST magazine. Some of the comments make for interesting reading. Part of the thread drifted to comment about the type and technical quality of articles presented in AR.

It was pleasing to see that several contributors responded that there was a simple solution to the lack of technical content – write something and submit an article for publication. All should take a moment to consider the situation here in VK: the Publications Committee is made up of volunteers. The WIA is primarily run by volunteers, with a small paid staff running the office with volunteer support. We have a very small membership compared to that of the ARRL. As a result, the WIA budget has constraints and the AR budget is similarly constrained.

Earlier this week I received my copy of QST – yes I am a member of ARRL, primarily to receive QST and QEX (a separate subscription). Excluding the covers, QST had 160 pages, of which 74 pages were advertisements, leaving 86 pages for all the other content. The high advertising content means higher income to support the magazine, as does the large number of subscribers. That higher advertising content comes to the magazine because of the size of the circulation. I therefore argue that those making the comments in the discussion thread are forgetting these important differences – they are not comparing apples with apples.

I will not discuss here the thoughts expressed by some on that forum regarding the cost of WIA membership, other than to say that those individuals apparently have blinkers in place restricting their field of view. Will some of them be applying to operate with 1 kW transmit power? Do they appreciate the work done at the recent World Radio Conference to protect our band allocations and operating privileges? If our privileges were reduced, I suspect that many would be jumping up and down expressing their thoughts; probably blaming the WIA for not doing a good enough job.

It is all too easy to sit on the side-lines and to cast stones, but such action rarely yields positive results. It is far more productive to become directly involved – nominate to become a member of an Advisory Committee, put your views to the

Continued on page 5



# WIA comment

Michael Owen VK3KI

## The International Monitoring System

In the middle of a WRC, the focus of all IARU attention, it must seem strange to talk of the IARU Monitoring System as being an important function of the IARU and one that should be supported by the national societies in each country.

In Australia we used to call the activity the much more descriptive "Intruder Watch", but the WIA has now followed the IARU and calls it the Monitoring System.

Most of us vaguely know it is an activity directed to seeking the removal of non-amateur stations from the exclusive amateur bands.

Why is it important?

To answer that one has to go to the ITU's Radio Regulations, in effect the treaty between nations that governs in detail the use of the radio spectrum.

Article 4 of the ITU Radio Regulations, the General Rules relating to the assignment and use of frequencies, provides:

*4.4 Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.*

An administration does not have to assign its stations frequencies in accordance with the Table of Frequency Allocations so long as

its stations do not cause harmful interference to a station operating in accordance with the Radio Regulations. Accordingly, if amateur stations suffer harmful interference they must complain, because until the administration knows that its station is causing harmful interference to stations operating in accordance with the Radio Regulations it can take the position that it is not in breach of the Radio Regulations.

It is one of the few activities apart from its role in the WRC process that many argue is an essential IARU role.

For many years the IARU has maintained the International Monitoring System, relying on the three Regional organisations appointing Regional Monitoring System (MS) Coordinators, who in turn collated the reports of the Coordinators in each national member society, who in turn collated the reports of the observers in their country. All of this was intended to work under the guidance of an International MS Coordinator.

In fact, there has not been an International MS Coordinator for many years, each Region had different methods and procedures and the processes established by the Administrative Council to facilitate inter-regional communication were to say the least bureaucratic and ineffective and were effectively ignored.

There is no doubt that the IARU Region 1 MS, under the leadership of Coordinator Wolf Hadel DK2OM and Vice Coordinator Ulrich Bihlmayer DJ9KR has set the standard for the regional monitoring systems, with a technically up to date and really useful website and methods and procedures that really work.

If you look at the IARU Region 3 website, you will find that it is still using a 1988 Manual, though under the leadership of IARU Region 3 MS Coordinator Peter Young VK3MV the MS has been operating effectively and collaborating efficiently with the other Regional coordinators.

The IARU Region 3 Directors raised the issue at the last IARU Region 3 Conference in Christchurch, New Zealand, in 2009.

The MS became the major work of the Conference, with the member societies seeing advantage in a more truly global system, identifying a number of areas where they considered a common approach was desirable and referred the matter to the Administrative Council of the IARU.

The Administrative Council is comprised of the IARU Officers and two representatives from each of the three IARU Regional organisations, IARU Regions 1, 2 and 3, and is the peak policy organ of the IARU.

The Administrative Council has now agreed on a very new approach.

It has given away the idea of an International Coordinator and the complex process for inter-regional communication and replaced it with the much simpler and totally logical structure of a single Monitoring System Committee comprised of each of the three Regional MS Coordinators and the President of the IARU, or his nominee.

By the general Resolution establishing the IARU Monitoring System and the Terms of Reference of the Monitoring System Committee the Committee will be responsible for the establishment of a single worldwide website, based on the

Continued on page 5

# WIA news

## WRC-12 enters third week

The ITU's 2012 World Radiocommunication Conference (WRC-12) has now entered its third week, with only one further week to follow.

Dale Hughes VK1DSH as a member of the Australian delegation to WRC-12 nominated by and paid for by the WIA has been reporting daily to the Board on the many hours of meetings and discussions, particularly on those matters that will affect the amateur service.

The proposal that has been agreed to by most administrations that support the amateur allocation calls for a worldwide secondary allocation to the amateur service at 472 to 479 kHz with a power limit of 1 watt e.i.r.p., but with a provision for administrations to permit up to 5 watts e.i.r.p. for stations located more than 800 km from certain countries that wish to protect their aeronautical radionavigation service (non-directional beacons) from any possible interference. Proposed footnotes provide administrations with opportunities to opt out of the amateur allocation and/or to upgrade their aeronautical radionavigation service to primary if they wish to do so. In addition to these protections for aeronautical radionavigation, the amateur service must avoid harmful interference to the primary maritime mobile service.

This proposal has now proceeded through the committee stages and will go to a Plenary meeting, where if it is approved on two occasions will become part of the Radio Regulations.

Dale has also watched meetings dealing with agenda item 1.15, dealing with oceanographic radar.

Of importance to the amateur service is the allocation of bands where

this service could operate, and the candidate bands include 5.250 to 5.275 MHz, where a number of administrations have granted amateurs access to spectrum around 5 MHz.

This could affect the amateur position that an allocation around 5 MHz to the amateur would be extremely useful, and a future agenda item dealing with such a proposal would be welcomed.

## Successful prosecution

A 63-year-old man from Melbourne's western suburbs pleaded guilty in the Werribee Magistrates Court on 11 January 2012 to several offences under the Radiocommunications Act.

The offences – unlicensed operation of a radiocommunications device, unlawful possession of a radiocommunications device and causing interference to radiocommunications – carry penalties of up to two years' imprisonment.

The prosecution followed an extensive investigation into alleged breaches of the Radiocommunications Act.

The court was told that, until August 2009, the defendant had been a licensed amateur radio operator but was investigated by the ACMA following extensive complaints about interference. As a result of the investigation by its Compliance Operations, Field Operations and Interference Management and Monitoring Sections, the ACMA cancelled the defendant's amateur licence. It was alleged that the defendant continued to regularly use his amateur transmitter from his home, contrary to the Radiocommunications Act, deliberately causing interference to licensed radio amateurs.

After further complaints, the ACMA traced the interference back

to the defendant's home a number of times. However, despite warnings from the ACMA, the complaints continued. The execution of a search warrant by the ACMA in September 2011 confirmed that the defendant had a large amount of radiocommunications equipment, contrary to the Act. Tests confirmed that the equipment was set to the radio frequencies that had been interfered with.

The court placed the defendant on a 12-month good behaviour bond, ordered him to dispose of all of the seized equipment within four months and to prove to the ACMA in writing that he had disposed of the equipment.

## RD Contest Manager steps down

Peter Harding VK4OD has advised the WIA Board that he wishes to stand down as Contest Manager for the WIA Remembrance Day Contest.

WIA President Michael Owen VK3KI acknowledged Peter's contribution as the RD Contest Manager for many years. "I well recall how Peter took over the role at very short notice, and I know how hard he has worked to ensure that this contest, seen by many as the premiere WIA contest, continues to be a success. Peter has asked me to tell you that his reason for retiring is that he needs to undergo treatment for prostate cancer and he wants to remind all men over 50 to make sure that they are checked for this disease."

The WIA Board was planning to appoint a new Contest Manager at its meeting on 18/19 February. Check the WIA website for an announcement.

## Don't forget

## 14-15 April WIA National Field Day

Mark your calendars for this day to demonstrate our hobby to the public in your area.



Open Forum, write some "Over to You" letters for publication in AR, undertake one of the many voluntary roles if you think that you can do a better job. If you are not a member, join the WIA and express your thoughts about what can be done better and/or volunteer to assist in some way. If you want to read more technical articles in AR, either write some articles yourself or convince someone with the appropriate

knowledge to do so. Or at least make the suggestion to me that a particular topic needs to be covered and I can attempt to find someone to write an article.

After all, it is your magazine.

### Coming soon

I note that a new hand-held radio features on the back cover this month – the Icom ID-31A. I have just received one of these units and hope

to have a review prepared in the near future.

Of course, we would welcome objective review articles on any item of equipment related to our hobby – if you think that you may have something of interest, let me know and get those fingers working on the keyboard.

Cheers,

Peter VK3PF

## WIA comment

Region 1 website, establishing common methods of communication and reporting and the preparation of appropriate training material.

Indeed, it has all started, with the IARU President communicating with the three Regional MS Coordinators, the Monitoring System Committee starting its work.

That all sounds very well, but is it all worth the effort? Is anyone going to take any notice, anyway?

Simply collating reports of harmful interference from stations not operating in accordance with the Radio Regulations does not achieve much.

The way it is all meant to work is that the national society in the country of the intruder goes to its administration and asks its administration to stop the interference.

And that is what happens in a number of cases.

But in other cases, the national society may not wish to do that. But other administrations may be prepared, once they have confirmed the reports provided by the national MS Coordinator, to approach the administration of the station causing the interference.

The new Monitoring System Committee with ultimately one method of reporting, with better coordination and focus and a single source of current information, should make this important task more attractive and more meaningful and attract new observers and in the end provide more credible observations and a better focussed approach to removing "intruders".

No, it doesn't always work.

But if we don't complain, who will?

Doing nothing is not an option.



## Election of Directors

A notice calling for nominations from people seeking election as a director of the WIA, in addition to the three retiring directors who stood for re-election, was published in the December 2011 issue of AR magazine.

The Returning Officer, Geoffrey Atkinson VK3AFA has reported that no additional nominations were received and accordingly Philip John Wait, Christopher Brian Platt and Robert Stanley Bristow were re-elected unopposed for a further two year term.

# The Centenary not to be forgotten

Jim Linton VK3PC

The celebration of the Centenary of Amateur Radio Victoria involved many people from all over the world between August and November 2011, 100 years after its foundation as the Amateur Wireless Society of Victoria.

A centrepiece of the celebration was in November when the activation of the special callsign VK100ARV took place, with about 5,500 QSOs ultimately in the logbook. Tied in with VK100ARV was a Centenary Award that proved to be popular and which saw about 100 being issued. The rules included valid contacts with the special callsign and VK3WI on four occasions, plus Amateur Radio Victoria members.

Award Manager Tony Hambling VK3VTH said, 'It was all over for another 100 years. Nothing but positive feedback has been received from the amateur radio community in general across the 30 days of operation of VK100ARV. The correct mix of bands and modes and the fact that the station was on the air at most times to suit VK and DX stations attracted many positive comments.' VK100ARV operated on a roster and included many diverse locations such as Gippsland, the Brisbane Ranges, Mildura, Swan

Hill and metropolitan Melbourne, often in severe weather conditions.

Each day was recorded in summary and shown to the world via the Amateur Radio Victoria website. It gained publicity through QRZ.com with nearly 10,000 hits plus the WIA weekly Sunday VK1WIA broadcast and Southgate News. It was also written up by numerous clubs. Due to the skill and experience of the operators they managed to have about 5,500 contacts in the activation period, each offering something of interest.

There were numerous television transmissions throughout November. Earlier, on the weekend of August 26-27, the world's first Digital TV QSO party was hosted by Peter



Photo 1: In early to get the first limited edition Centenary Award is David VK3JDA, who also qualified for the revived Keith Roget Memorial National Parks Award.

Television Club's streaming website. This event was also relayed through the regional amateur television repeater VK3RBO Bendigo on the 13 cm band by Ross Pittard VK3CE.

Peter VK3BFG said, 'What happened on the Friday and Saturday was a DATV QSO party to celebrate the 100th the anniversary of Amateur Radio Victoria, a most fitting contribution to the Century celebrations.' Thanks go to Peter Berrett VK3PB who featured the digital television element in a special edition of the popular Amateur Logic TV program, in episode 33. The event really captured the imagination and has been widely reported in both specialist publications and newsletters.

On November 2 Peter VK3BFG ran with VK100ARV through VK3RTV, giving it exposure to the DATV gang and further support to the centenary. On three Mondays the Digital SSTV Group, using the EasyPal software, was eager to use it during its weekly nets via VK3RML.

During the celebration the Keith Roget Memorial National Parks Award had its targeted weekend of November 18-20, a really great public exposure. On two occasions



Photo 2: The person behind the world's first digital amateur television QSO party was Peter VK3BFG, shown here at the controls of his VK3RTV linked station.



Photo 3: Putting VK100ARV on air both portable from the Brisbane Ranges National Park and at his home QTH, and including the final QSO, was Terry VK3UP.

VK100ARV ventured into the National Parks, these being Mt Baw Baw by Peter Freeman VK3PF and the Brisbane Ranges courtesy of Terry Murphy VK3UP.

There was further portable operation, DX operations in many modes, VK contacts on most bands and modes and of course club participation on all levels. The first contact under VK100ARV was made by the Scout Radio Electronics Service Unit with Alex McDonald VK4TE. The signal was hard copy however Greg Lipschitz VK3LLL did a sterling job in getting the QSO in the log. The SRESU site at Gilwell Park, Gembrook, and the brother and sister scouts on the VK100ARV QSL card were to be subject of a story in the national magazine 'Australian Scout'.

The Western and Northern Suburbs Radio Cub took VK100ARV to Bundoora Park and later from members home QTHs during five straight days. It was soon back for more and given slots for the special callsign during its weekly net.

The Sunraysia Radio Group had it late in November and despite severe storms managed QSOs from Mildura and Swan Hill. Multiple days saw activation by Keith Proctor VK3FT, Luke Steele VK3HJ, Terry Murphy VK3UP, Tony Hambling VK3VTH and Joe Walsh VK3XH. At the end of the

30 days the final contact, on 40 m, was by Terry Murphy VK3UP with Grant Taylor VK3HP.

Almost completed is the distribution of the QSL cards for the VK100ARV contacts, either via the bureau or direct, the Centenary Award and a few Keith Roget Memorial National Park Award applications. Both the QSL card and

the Centenary Award certificates feature a montage of people and places. On the QSL card is a selection of Presidents and text defining the occasion.

The Amateur Radio Victoria Centenary Council would like to sincerely thank the Scouts Radio and Electronics Unit, Peter Fraser VK3ZPF, the membership of WANSARC VK3AWS, Michael Amt VK3CH, Keith Proctor VK3FT, Luke Steele VK3HJ, Peter Cossins VK3BFG, Terry Murphy VK3UP, Michele Grant VK3FEAT, Jim Linton VK3PC, Gary Furr VK3FX, Stephen Ireland VK3SIR, The SSTV Group, Peter Freeman VK3PF, Joe Walsh VK3XH, Tony Hambling VK3VTH, the membership of the Sunraysia Radio Group VK3SRG and Noel Ferguson VK3FI, and the Amateur Radio Victoria membership that came up on air to add to the points tally.

Those who joined the roster as individuals or as part of a team made it the most successful special callsign event of its type. Without their strong, enthusiastic support and dedication VK100ARV would not have been possible.



Photo 4: Over several rostered shifts Luke VK3HJ made a sterling effort on the key to score many contacts on that mode.

John Fisher VK3DQ



*Photo 1: SPARC members work on the new operating positions in their clubhouse.*

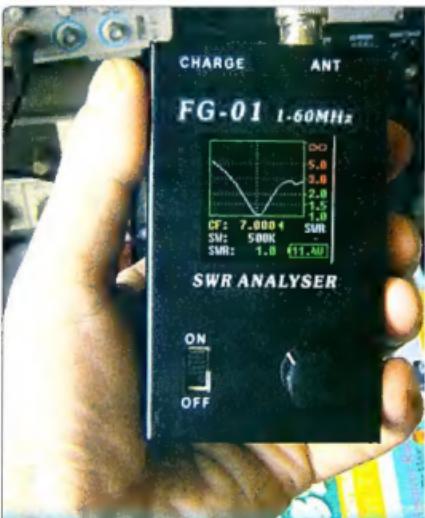
Recently members of the Southern Peninsula Amateur Radio Club (SPARC) held a working bee to fit out their new radio shack. A new

operating bench with enough room for five operating positions was installed complete with concealed cable ducting. The radios in the shack are operated from two large 12 V power supplies which are mounted on a specially fitted shelf and connected to the radios using an Anderson plug distribution system. This enables all the equipment to be free of the normal tangle of wires that we sometimes encounter and provides a clear operating space for log books and the like.

Not content with this, club

members installed a split system air conditioning system in the shack ensuring comfortable operating conditions in both summer and winter. Many club members enjoyed the day and of course many hands make the work seem lighter.

*Photo 2: SPARC members work on the new operating positions in their clubhouse.*



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Bevan McAleer VK4BCM

## Titanic 24 hour sprint 2012

FISTS UK are organising a special 24 hour sprint contest, commemorating the 100th anniversary of the sinking of the RMS Titanic on 15 April, 1912.

A number of FISTS affiliates worldwide have indicated their participation, with special calls being sought, or already obtained, for the event.

The Queensland Maritime Museum is hosting the venue in Brisbane, utilising their facilities and prestige, and a special callsign is being sought for the occasion.

The rules are:

Contest: Titanic 24 hour sprint 2012

Date: 0001 - 2359 UTC Sunday, 15 April, 2012.

QRG: All licensed amateur bands except the WARC bands.

Rules: Recognising the 100th anniversary of the loss of the RMS Titanic on the 15th April 1912. This event is a standard exchange between stations.

Scoring: 10 points for any Titanic special event station.

5 points for a FISTS HQ station (GX0IPX, GX3ZQS, MX5IPX, VK2FDU, ZL6FF, JL3YVM, KNOWCW).

3 points for a FISTS affiliated club station.

2 points for a FISTS member.

1 point for a non-member.

Logs: Are to include Date/Call/Name/QTH/QRG/Time/ FIST No or NM/ Points.

All entries may be posted to R D Walker M0BPT, Box 6743, Tipton, DY4 4AU. England, or by email to m0bpt@yahoo.co.uk, in Excel/csv/ tabbed word document format, if possible. They are to be received no later than 30 April 2012.

General: Titanic special event stations from around the world will be active on this day.

We would encourage amateur radio clubs in other cities to investigate the availability of a maritime site in their city, and their participation in the contest.

All enquiries may be directed to Bevan McAleer VK4BCM, on email [bcmcaleer@gmail.com](mailto:bcmcaleer@gmail.com) or by phone to 0418 986 520.

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This unit is a 10Hz to 2.7GHz dual range frequency counter for measuring functions of frequency period totals and self checking. The counter readout has a large 10mm high intensity 7 segment LED display with gate time and data hold function. Decimals are also included as well as a single step input attenuation to a factor of 20 and a low pass filter. QT-2202

\$169.00



### Digital Sound Level Meter

Featuring a wide dynamic range from 30 to 130dB, it can measure both A and C weightings and can have fast or slow responses to get an 'ambient' reading or a short noise. Includes data hold and min/max functions, as well as tripod mount. Supplied with carry case, wind sock and battery.

- Size: 210(H) x 55(W)mm
- QM-1589

\$99.00



### Logic Tester

Quality logic probe that will test all logic families (TTL, LS, CMOS, etc). It will also Will detect pulse widths as narrow as 25ns and for frequencies up to 20MHz.

- 4-16VDC
- Current consumption Max 32mA @ 5V
- Operating temp -20 +70°C
- QT-2210

\$29.95



### Pro Gas Soldering Tool Kit

A sturdy, portable, self-igniting butane powered gas soldering iron tool kit. Produces a 1300°C adjustable flame for low end brazing, tin/plastic melting, automotive repair work, welding and of course heat shrinking. Supplied with 3 interchangeable metal tips, plastic carry case, cleaning sponge and deflector

- Operating time: 80 - 100 min
- Torch dimensions 236(L) x 37(D)mm
- TS-1113

Spare tips & butane gas available separately.



\$69.95

### TV Hearing Aid Earphones

It uses noise cancelling technology to reduce background interference and features voice clarification technology so you don't miss any dialogue in your favourite TV show, news broadcast or movie. A tone control button allows adjustment for different frequency hearing abilities. When not in use the cradle charges the batteries

- Multi user listening from receiver
- 12 hour battery life between recharges
- Headphone size: 195(H) x 130(W)mm
- Base size: 120(W) x 97(L) x 18(H)mm
- AA-2079

\$129.00



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# The evolution of a communications trailer (or mobile shack)

Lino Rizio VK3EI



Photo 1: Front view showing the jerry can holders for fuel and water.

## Background

I like to build and test antennas of various types but there is usually a problem when it comes to setting them up and using them because of space limitations in the suburban environment and the high level of QRM that invariably exists in the suburbs. As a consequence, I tend to go

camping a fair bit with the primary objective being to test antennas and 'play radio'.

The biggest annoyance for me is loading (and then unloading) my standard 4 x 5 trailer at each end of the trip. I decided that a purpose built communications trailer, my *mobile shack*, would be a better solution, so I started mapping out a potential design specification that would suit my specific requirements.

## System requirements

1. An abbreviated list of the essential elements of what I wanted was:
2. An enclosed trailer with a good degree of weather proofing.
3. Load capacity of up to 1.5 tonnes.
4. Storage for a number of 6 m and 9 m EMDRC masts.
5. Space for larger antennas.
6. Built in working/operating surface.
7. Internal lighting for night operations.
8. Deployable energy sources including batteries, generator and solar panel.
9. Adjustable internal storage.

## Getting started

Over a number of weeks, I kept an eye on the trailers available on eBay until I came across a beautiful looking steel trailer, Photo 1, one that I managed to get at a fair price. It turned out to be a 7 x 5 enclosed box trailer with a load capacity of just under two tonnes and, being a tandem axle, is very stable and easy to tow.



Photo 2: Rear view showing the Clark pneumatic mast.



Photo 3: Left side view showing the fold-up door for access to the work table.



Photo 4: Internal view showing racking and general placement of items.

Both sides of the trailer have flip-up doors operated by gas struts and the rear has twin doors, all of which are fully lockable with no less than eight locking points.

Photos 2 and 3 show the right and left sides of the trailer. You can see that both of these have lift-up sides but I chose to permanently lock the right side and only use the left (kerb side) opening. My reasoning for this decision was that if I needed to operate in a mobile environment I could pull off to the side of the road, open the operating position, more on that later, all from the safety of the kerb.

The rear of the trailer has two full doors that allow complete access to the inside. Photo 4 shows the rear view with the doors open; the rack system that evolved over a number of iterations and has ended up in its current configuration seems to work very well with easy access to just about anything that I may need on site.

### Layout and operation

As I was aiming to minimise the amount of unpacking, I decided to incorporate the radio operating position into the trailer rather than have to set up a folding table, as I had

been doing, on which to put the radio gear. I attached a fold-down table, Photo 5, made from a solid core door, to the left side opening and fitted latches to hold it in position when stowed. The table folds down quickly and lowers to the horizontal with the two ends supported by chains. I used chain instead of hinges to allow the table to be adjusted to the horizontal even if the trailer is not on level ground.

This working surface is covered in a very low pile marine-grade carpet. This table makes it very easy to work when you first arrive on site as you quickly have a flat area to put things on instead of putting everything on the ground as you unpack.

The trailer also has a nice rail system around the top that made it easy to fit a couple of custom-built aluminium mast holder tubes in the centre of the front and rear rails.

Photo 5: Side view with work table in operating position.



The mast holder tubes, Photo 6, can accommodate up to five 9 m aluminium masts, plus tent poles and so on, and are securely fixed to the steel rails for safety. The reason for mounting these in the centre is to leave space either side to take other long items needed for camping from time to time or for long antenna sections that I may have to carry in the future. Foam rubber pads were glued to the inside of the tube end-caps, Photo 6, inset, to protect the caps should the contents of the tubes slide around under braking/acceleration forces.

Extensive use of plastic storage boxes has been made to categorise the various bits and pieces needed when setting up antennas. These boxes stack easily in the shelving, making it possible to minimise floor space usage, thereby leaving an aisle down the centre of the trailer. The aisle allows access to any part of the trailer without having to take everything out to get to something in the far corner. As there are a number of items that do not really need to be moved very often, these are located towards the front of the trailer, farthest from the rear doors; these are the fridge, spare antenna/mast accessories, folding table and the solar panel.

Photo 6: View inside storage tubes for antennas and masts.



## Power system

The majority of devices requiring power are run from a bank of storage batteries. I originally had the batteries clamped down at the base of one of the racks but access was difficult so a battery box, Photo 7, was constructed and bolted to the floor on the left side of the trailer, just below the work table, the main radio operating position. The storage batteries have a total capacity of approximately 310 Ah (350 Ah including auxiliary battery).

The three main batteries, one 150 Ah and two 80 Ah, are connected in parallel and fitted with a 60 A DC circuit breaker that feeds the Powerpole distribution board, fused, shown in Photo 8. There is also a small auxiliary battery, of 40 Ah, that is used to drive the air compressor for the Clark pneumatic mast (discussed later) and the LED work light. I should note here that I have put Anderson Powerpole connectors on just about everything, including all my radio gear. The Powerpole distribution board has a 1 m cable attached that makes it easy to move around to connect to anything that needs power.

There are a number of other power sources available in the trailer; a solar panel with a 120 W rating is able to be deployed on sunny days and it is able to deliver a constant charging current of over 8 A to keep the batteries charged. On sunny days this has meant that all of the power stored in the batteries is available once the sun goes down and no other external power source is required.

Photo 9: Switches for lighting and reversing camera.

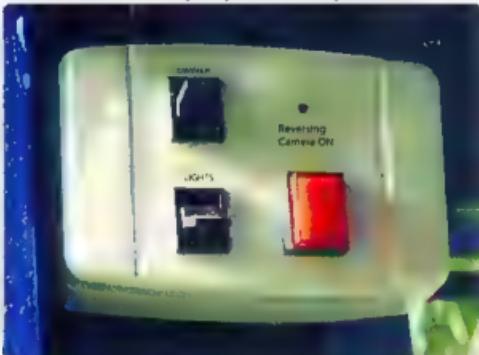


Photo 7: Battery box containing AGM storage cells.



Photo 8: Everything is terminated in Anderson Powerpoles.

Where we need additional power, a small petrol generator is carried on board to provide 240 VAC. This is used to power the battery charger that has a charging capacity of 25 A and is able to restore the batteries to full charge within a few hours. The generator has a running time of approximately 10 hours from a full tank which means that we are able to keep operating all night if necessary without requiring mains power at any stage. I have never had to run the generator full time as the charging rate is sufficient to only require running it for a couple of hours whenever the battery voltage indicates that a 'boost' is required. I have a number of battery monitoring displays at different points in the electrical system.

## Lighting

For night time operation, internal LED strip lighting is fitted to the ceiling. As it turned out, these lights are extremely efficient and I found that they were actually too bright at night. I decided to fit an LED dimmer control which subsequently was found to generate a huge amount of radio interference.



Photo 10: 12 V LED lighting strips on ceiling.

I should have done more thorough research on this as I found that these devices use pulse-width modulation to vary the current through the LEDs and therefore generate lots of RF noise. I decided to go back to basics and replace the dimmer with a simple resistor switched into the LED supply line whenever I needed to dim the lights and this solved the RF problem and works to reduce the light intensity to a nice working level. The simple switch arrangement is shown in Photo 9; this also has the control switch (red button) that controls the power to the reversing camera.

I said at the outset that the trailer has undergone a number of iterations and during one night time operation I found that the internal lighting made it difficult to see the front panels of the radio equipment because the light was coming from behind the equipment.

The solution to this was to add a couple of strips of LED lights to the side lift up panel of the trailer that is directly over the work table.

These lights provide even lighting from directly overhead, giving no reflections on any of the radio front panels. The roof mounted strip lighting is shown in Photo 10 and the LED lights over the work table are visible in Photo 5.

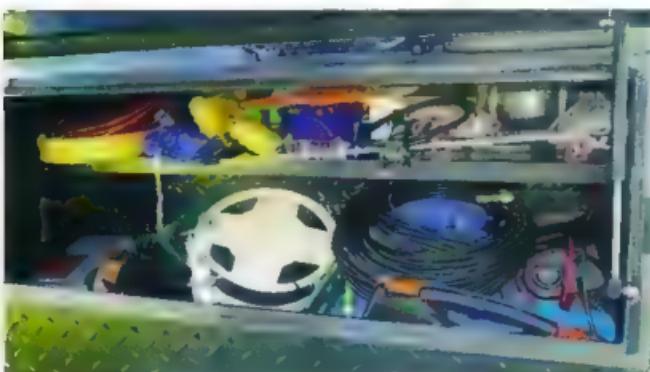


Photo 11: View inside the front storage box containing loose items.

## Storage and water

To further reduce clutter inside the trailer, a lockable steel toolbox was installed on the towing arm, see Photo 11 and refer to Photo 1. Here, smaller items, such as tools, ropes, coax cables, battery charger, straps are stored. The trailer auxiliary battery is also mounted here; this battery feeds power to the rear view reversing camera, refer to Photo 6, the Clark mast and the work light as mentioned earlier.

When deployed, the trailer is completely self-contained and it is possible to remain deployed for a few days at a time without reliance on any other external infrastructure. This is important as I am a member of WICEN (Wireless Institute Civil Emergency Network) and I want to be able to deploy the trailer in emergency situations should the need arise. For this kind of deployment, I have catered for the ability to erect a sun/rain shade, Photo 12, that makes being out in the open a little more comfortable.



Photo 12: Sunshade awning deployed over the operating position.

This was originally a 4 m by 6 m heavy duty tarp, as seen in the photo, but I have since replaced this with a 3 m by 6 m steel framed marquee. The marquee frame is visible in Photo 5 directly behind the blue jerry can on the left side of the trailer. The blue jerry can is also an interesting piece of high-tech equipment; it is called a *Lifesaver* jerry can ([www.lifesaversystems.com](http://www.lifesaversystems.com)) and it contains a membrane filtration system that can turn any source of water into pure drinking water. The water produced is essentially sterile and can be used for medical purposes if necessary. The jerry can has the capacity to filter up to 20,000 litres of water before the filter requires replacement. This system therefore caters for our water requirements when the trailer is deployed in the field. The trailer also has cooking facilities and a stock of canned food sufficient for a few days in the field. A small fridge allows perishable items to be stored safely.

## Antenna mast

The free-standing Clark pneumatic mast, Photo 13, which I mentioned earlier, is a real winner. It has dramatically reduced my use of the aluminium masts that I had come to rely heavily upon for all of my antenna erections.

Because the Clark mast is easily and quickly raised or lowered, it is possible to change antennas in a matter of minutes. The mast is approximately 9 m tall when fully raised and I have evolved a common quick-change adapter system for the top of the mast that allows rapid swapping of any antenna simply by lowering the mast, removing the installed antenna, and dropping in a different antenna (that uses the same quick-change base adapter).

For even quicker deployment, a FAMPARC whip (manufactured by the FAMPARC club) is installed on the roof rack and can be raised and locked in the vertical position within minutes. This allows the trailer to be operational on HF at any time with minimal setup.

A small air compressor, mounted in the front toolbox, quickly raises the mast as only 20 psi of pressure is required. Once raised to full height, an air valve is closed and the mast remains in position until the valve is opened. Raising and lowering takes about 60 seconds in each direction.

Photo 14 shows the mast in its lowered position with a quarter-wave vertical antenna fitted and ready to be raised into its operating position. Photo 13 shows the system in operation.

## Off-road trials

The trailer has also been tested in off-road conditions on French Island, which is located in Westernport Bay, during a period of heavy rain. The roads were peppered with potholes full of water which were difficult to avoid, however the trailer, and its contents, had no problems and everything survived intact, Photo 15.

This 'mobile shack' has been evolving for almost a year and it is finally at a stage where changes are now very minor - more in the line of 'tweaking'.



Photo 13: The Clark mast in its deployed position.



Photo 14: Mast with antenna fitted and ready for raising.

I do not expect any dramatic changes to the configuration because it has been operated under a range of conditions and performed flawlessly, or nearly so, on all occasions.

The radio equipment and the associated electrical and antenna systems have also evolved during the evolution of the trailer but I will leave discussion of those for another time.



Photo 15: VK3EI and trailer at the end of a field trial.



# VK3BAD at Cape Liptrap for the ILLW 2011

John Fisher VK3DQ/VK3ARK

Over the four days from 19 to 22 August, a group of 18 amateurs and friends travelled to near Cape Liptrap to operate a special event station and to activate the Cape Liptrap light station for the International Lighthouse and Lightship Weekend (ILLW) event.

The main group had an early start with our pre-convoy meeting for coffee and breakfast at the Tooradin bakery at 8:30 am. At 9 am our seven car convoy departed for Cape Liptrap, about a 90 minute drive through the lush green countryside via Kilcunda and Wonthaggi (the site of the new desalination plant). The convoy then proceeded via Inverloch and Tarwin Lower to our base camp at Bear Gully Cottages.

On arrival, the various teams sprang into action. One team set up the antennas and another the radios whilst a third provided a meal of hot leak, potato and bacon soup served with some nice crusty bread. By midday our station was on the air and making contacts. There were four operators, three on HF, mainly 40, 80 and 20 metres, with the fourth operator working two metres and 70 cm.

The weather at this time was a little overcast but during the afternoon the sun came out and stayed with us



Photo 1: Cape Liptrap light.

all the time we were there. The area around Cape Liptrap was shown at its best with blue skies and light breezes. Taking advantage of the weather, we dispatched a team to the light station, who walked in the 400 metres from the car park and operated portable. They also posted a static display that consisted of some information about the lighthouse weekend and some small 'amateur radio gets the world talking' posters. As the weather was

so good this year, the team managed to operate from the light station on all four days of the trip in addition to operations from Bear Gully.

During the afternoon everyone settled into their rooms; they were spread across three cottages and the rookery. All agreed this was the way that "roughing it in the wild" should be done. The day passed very pleasantly and as darkness fell, the aroma of roast chicken was detected. It was agreed that a few 'dusty' bottles should be sampled and the group sat down to a very nice meal. This was rounded off by a little something from the cheesecake shop. After dinner, nuts and nibbles were provided and the station worked well into the night.

Saturday morning was one to remember with the sun rising over Wilson's Promontory and quickly dispersing the morning mist. The first order of the day was coffee and then a breakfast of eggs, bacon and all the trimmings. The radios were fired up and the station operated solidly for the next four hours, both at Bear Gully and the light station site. The Cape Liptrap light stands upon a rocky cliff top, on a solitary part of the South Gippsland coastline, warning ships of the rocks in treacherous Bass Strait.

Photo 2: Operating at the light.



## History

The first Cape Liptrap lighthouse was established in 1913. It was a 2.1 metre steel tower with an acetylene light. As a keeper was never stationed at Cape Liptrap, it is really the first automatic, Commonwealth-funded light to be put into service. The current lighthouse was built in 1951 in cast concrete and is octagonal in shape. It was converted to mains power in 1970. The lighthouse is on an isolated point in the Cape Liptrap Coastal Reserve and can be reached via Walkerville.

Arriving back at Bear Gully, members of the team were treated to a BBQ lunch of prime rib eye steak, which helped to stave off the pangs of hunger that their efforts had induced. After this it was noticed that several members of the team did take a little afternoon nap. In the meantime, the rest of the team had arrived and were lending a hand with the erection of some large vertical antennas.

The station worked solidly contacting both local and DX stations into the early evening when dinner was served. Dinner consisted of two legs of roast pork with all the usual trimmings, followed by fruit strudel and custard, cheese and biscuits. The station operation resumed working well into the night.

Sunday morning saw a perfect start to the day, with clear blue skies. Again, a good hearty breakfast was served, and, as before, a team was

dispatched to operate portable from the light station. A number of team members also took the opportunity for a midwinter stroll along the beach, enjoying the sunshine and taking in some lovely winter flora along the way. Lunch again was that wonderful rib eye steak with a nice glass of red wine....

On return of the portable station crew to our base at Bear Gully, the team operated into the early evening before taking a break for happy hour. This consisted of pate and dips. This was followed by dinner that consisted of roast beef with Yorkshire pudding and the special event of the day 'Cake Liptrap'.

The station again operated well into the night with many local and DX stations in the log book. For those not operating the radios, many tall and true tales were swapped in the rear area seated around the blazing wood fire.

Monday morning dawned as yet another perfect day. Everyone enjoyed breakfast as normal and some early morning DX. Then all hands helped packing up the station. At approximately 11:30 am our convoy of eight cars left for the drive home, taking with us memories of a major portable operation, some great DX and best of all, four days of fellowship and amateur radio.

## Postscript

A few days later we received an e-mail from Gary at Bear Gully

Cottages saying how much they enjoyed hosting our event and inviting us to return in 2012, an invitation that we will be accepting.

## Some details of the Cape Liptrap light

The light's location is at latitude 38° 54' 5" S, longitude 145° 55' 4" E. The elevation of the light is 93.6 metres above sea level, and its light has a range of 18 nautical miles. The light itself is 9.75 metres high. Flashing three times every 15 seconds, the light is mains powered, and its intensity is rated at 40,000 Candelas.

The operator of the light is the Australian Maritime Safety Authority.

*Editor's Note: Whilst this activity coincided with the International Lighthouse Lightship Weekend, only the contacts made from the immediate vicinity of the actual lighthouse would be valid contacts for the ILLW activities. The location at Bear Gully is too far from the lighthouse to meet the guidelines for official ILLW activities. More information on the ILLW can be found at <http://illw.net/>*

*As of late January, there are already 31 ILLW operations at Australian lighthouses registered for the 2012 event. Anyone considering participating should commence planning as soon as possible.*

## Over to you

### Comments from Ted Thrift VK2ARA / VK2XA

This is my second attempt as some offense has been taken over my forthright criticism of the proposed general rules

have no wish to offend but I enjoy my contest time and do not wish to see it bound by unnecessary and confusing rules.

There are many points that I dislike but to try to make a point that will cause a rethink, will deal with just one part of rule 3.

#### 3. Contacts:

(a)

- A contact consists of an exchange with acknowledgement of callsign and contest data. No more need be said as this is very clear and definitive.
- Incomplete contacts must be logged with zero points claimed. This rule is in conflict with the first statement. Unless it complies with the definition, it is not a "Contact" incomplete or otherwise. I suspect that the intention may have been to provide checking data but that is not necessary. If I

claim a contact with VK&xyz and you compare my log with that station and the contact is confirmed, it is valid. Invalid if not confirmed

- Points are not lost if a non-competing station does not send appropriate information but a report must be logged . . . Firstly, competing or not if the other station fails to send the required contest data, it is not a "Contact" as defined above and no points can be claimed anyway. In any case if it was logged and points claimed, see last sentence in 3 (b) where the contact may be disallowed.

This is just one part of one rule and I have taken the literal meaning of the words. There is no room in rules for "but that is not what is meant" if the rule says it, that is what it means.

I do hope that this demonstrates why my first comments were so strong. I would be interested in knowing how many of the amateurs consulted over the general rules were actually regular contest participants.

*Editor's note: Ted had circulated an earlier document for possible publication, but later withdrew that document. It has therefore not been published.*

# ALARA

Margaret Blight VK3FMAB – Publicity Officer



Photo 1: ALARA at the Sandringham Yacht Club.

Our neighbouring women operators in New Zealand are planning to celebrate the 50th anniversary of their organization WARO (Women's Amateur Radio Operators) in March this year. Several ALARA members will be going over to participate in the celebrations. Most of the women have a sponsor living in New Zealand and will be looking forward to meeting up with them. Also Jean VK3VIP has family living in Auckland and intends to spend a further few days visiting them. We will have further details when the ALARA group returns.

## VK3 News

The first ALARA lunch for the New Year took place at the Sandringham Yacht Club, where all enjoyed a view over the ocean while eating our meal. Ten ALARA members attended along with a number of their OMs.

We were lucky enough to experience the occasion as one of our members was also a member of the Yacht Club. As a special treat after lunch, we were able to go into the Yacht Club tower to view the close of a race and see the supervisors monitoring the entrants as they crossed the finishing line. The views from up there were spectacular we could see right along the coastline to neighbouring Yacht Clubs on either side. We learnt they were using 27 MHz CB marine radios for which I understand no licence is needed. This differs from past practice when communication was ship to shore and ships had their own radio operators. Perhaps this is a recruiting

opportunity for an amateur radio club to follow up.

## Kyneton hamfest

This year Jenny VK3WQ and Pam VK3NKL will be manning the ALARA table at the hamfest in February. So look out for them if you are attending.

## VK4 News

Lyn VK4SWE from Sweers Island reports: Main news from my QTH is that I finally got on six metres and found out what all the excitement was about the Magic Band. Hil Harold VK4ANR gave me a six metre rig, and his friend Ross VK4RO did extensive work to get it operational. I already had an antenna on my CP6. The rig sat on the bench in silence until Ross rang me to say the band was open – he had heard a Hawaiian station on it.

I fired up the radio, called and had an instant pileup – to Japan. It was incredible! Crystal clear reception, about 18 stations then it disappeared as quickly as it began. I am keen to work the Hawaiian station. Ross says he calls on CW but nobody ever comes back to him so he switched to SSB for them. It would be fun to work him on CW.

During the past year I have had a few QSOs with YLs, on both CW and SSB. Recently we had good enough conditions for a chat with Gita OM5MF.

## Another project from Carmel VK2CAR - The MKARS80

I took some spare time to finally build a MKARS80 lower sideband QRP transceiver for the 80 metre band, a project from the Milton Keynes Amateur Radio Society. This has been a real fun project. Assembling the components on the PCB was relatively simple even though one capacitor was missing, which caused a quick drive to the local Jaycar store in

pouring rain. I had virtually every other value ceramic in my junk box except the one I wanted – isn't that always the way! And despite what some friends said, I don't see any problem winding my own toroids.

The radio employs a PIC and uses 'huff n puff' stability which takes a little time to settle after warm up. This is a proper LSB radio, not a DSB (double sideband) that some other QRP projects have. Having no SMD components meant construction was kind to my eyes.

The basic radio is pretty low budget and doesn't have an AGC so I may add one later, as there are a few mods sites with AGC details available, and substituting the polyvaricon, different mounting configurations are options. I added a couple of my own mods including an internal speaker, an s-meter circuit I made up on separate vero and an internal battery pack. Rod and I sat down and designed a new case for it in SolidWorks and I had this bent up and powder-coated for a reasonable cost. Everything fitted nicely though if I redesign the front decal it will look considerably different.

Initial contacts gave good signal reports even on three watts, beating some others on a hundred watts, which only goes to prove that a good antenna is almost everything, and this particular radio design always results in good audio reports. This will be a great QRP (low power) radio for the field. A friend wants me to make one for him – maybe if time permits, and I don't start building the MKARS Pic-A-Star, though this project was a lot quicker to do than the electric vehicle!



Photo 2: View inside the Sandringham Yacht Club tower.



# VK7news

Justin Giles-Clark VK7TW  
e [vk7tw@wia.org.au](mailto:vk7tw@wia.org.au)  
w [groups.yahoo.com/group/vk7regionalnews/](http://groups.yahoo.com/group/vk7regionalnews/)

## Repeater News

Hayden VK7HA lets us know that VK7RCH on Grey Mountain in the Huon Valley will soon have a CTCSS tone of 123 Hz. This is due to persistent interference on the input frequency of 433.575 MHz. Much time, energy and resources have been spent on tracking down the interference without success. Thanks to Brian VK7RR who has donated a new diplexer for repeater VK7RIN (438.500 MHz) at Barren Tier in the central highlands and thanks to Joe VK7JG who has also installed a new backup battery for VK7RIN. Work has also been taking place on the VK7RMD (146.625 MHz) Mt Duncan repeater on the north west coast as the repeater is experiencing battery problems and thank you to Winston VK7EM for trekking up the mountain with temporary batteries.

## Sewing Circle Net - Meet the Voice BBQ

The Sewing Circle Net happens every day on 3.59 MHz between 05.00-06.00 pm (local) and has been running for many years. The group organises an annual Sewing Circle Net 'Meet the Voice BBQ' in picturesque Ross in the Tasmanian Midlands. This BBQ is a chance for amateurs to get together in a social setting and meet the voices they have been talking to on air. This year it happens on Sunday March 18, 2012. A feature of this year's BBQ will be an auction of amateur radio equipment with all proceeds going toward the repeater network in VK7. The group now has their own website which can be found at: <http://www.sewingcircle.org/>

## VK7 Regional News broadcasts

Following some research thanks to Mike VK7FB we have pushed back the age of the VK7WI broadcast to 1935.

Mike has uncovered that on 21 January 1935, 7WI was given permission to broadcast at specific times on 1310 kHz with music and announcements. Would you like to be involved in this 77 year history? We are always looking for amateurs to read and record the broadcast or rebroadcast on HF around the state just once a month. We even have designs for patch boxes. You can contact the author at the email above or call him on 0439 016 622. The VK7 Regional News website can be found at: <http://groups.yahoo.com/group/vk7regionalnews/>

## Northern Tasmania Amateur Radio Club

Airservices Australia host the NTARC VK7RAA repeater on Mt Barrow and they have a new induction qualification requirement for anyone entering their facilities. This involves a two stage approval process and NTARC now have six people who have successfully undertaken the qualification process. NTARC's informal coffee mornings happen each Monday and Friday at Friends Cafe in Jimmy's complex in Charles Street, Launceston. Start time is 10.30 am. The NTARC website can be found at: <http://www.ntarc.net/>

## Cradle Coast Amateur Radio Club

If you are interested in a Foundation licence or upgrading your Foundation or Standard licence on the north west coast then please contact the CCARC Learning Organiser & Assessor, Keith Winkler VK7KW on email: [ccarc.inc@gmail.com](mailto:ccarc.inc@gmail.com) The CCARC website can be found at: <http://my-x15.net/ccarc/>

## North West Tasmanian ATV Group

The NWTATVG have been broadcasting video archive material on the VK7RTV ATV repeater and via the batc.tv streaming service under

the member stream - 'VK7AX'. This material has great VK7 historical content and recently included the state-wide Hamfest held at the Penguin High School in the 1980s. The schedule for these programs can be found at the NWTATVG website at: <http://www.vk7ax.id.au/atvgroup/>

## Radio and Electronics Association of Southern Tasmania

Congratulations to Scott Bragg who passed his Standard licence assessment. At the time of writing was awaiting his callsign. We also congratulate Jacob who now has his callsign - VK7FAAF. Jacob is one of four Newtown High students who are recipients of the WIA grant funding to get them through their Foundation assessment, licensing and membership of the WIA and REAST. The REAST AGM will be held on Sunday March 11, 2012 at 11 am and will be followed by a BBQ.

Our DATV Experimenter's nights have been demonstrating the length and breadth of this great hobby through show and tell which has included: construction of a valve 160 and 80 metre AM transmitter, patch and isolation boxes, Arduino control circuits, Microbric robotics modules, Morse key powered QRP transmitter and Pye Bantam portable radio. Our video presentations have included: HORUS, EMDRC VK3LL hands free kit, portable contesting, historic films from WWII from the Hallicrafter's factory, Amateur Logic.tv, the CODEC2 Linux conference presentation and the Lost Islands - An Amateur Radio Polar Diary 2001 video which was well received. We stream these nights compliments of batc.tv via the member stream 'VK7OTC'. The REAST Website can be found at: <http://www.reast.asn.au/>



# VK3 news Amateur Radio Victoria

Jim Linton VK3PC

e [arr@amateurradio.com.au](mailto:arr@amateurradio.com.au) w [www.amateurradio.com.au](http://www.amateurradio.com.au)

## Now for the TV highlights

Following the running of a successful Centre Victoria RadioFest at Kyneton last month, there will be highlight segments shown through both ATV repeaters. These are Mt Dandenong VK3RTV, which services Melbourne and Geelong, and also through Bendigo VK3RBO. The news crew was kept busy gathering footage during the fifth running of the event. Whether you made it or not to the event last month the highlights video is not to be missed.

## Warship on air

In recent years Amateur Radio Victoria has activated VK3RAN a number times on board the museum ship HMAS Castlemaine moored at Gem Pier, Williamstown. The next activation will be on ANZAC Day, April 25, during which there will again be a focus on Amplitude Modulation (AM). Event Coordinator Terry Murphy VK3UP will try out a new antenna tuning unit while joining others in an afternoon that will include contacts with other ships and museums. All are welcome to join them on air.

## Classes this month

The statewide organisation turns its attention this month to the resumption of its quality Foundation licence weekends, which have seen many enter the hobby, and the next of its Standard bridging courses. Education Team Leader Barry Robinson VK3PV reports that the Foundation licence class will be held on the weekend of 24-25 March.

A bridging course, open only to holders of the Foundation licence, will be run on Wednesdays of March 7, 14, 21 and 28, and April 4. The bridging course starts at 6.30 pm, for three hours. A refresher session will be held on Saturday April 14 and assessments will be on Sunday April 15.

Enquiries may be sent to either [foundation@amateurradio.com.au](mailto:foundation@amateurradio.com.au) or 0428 516 001.



The VK3RAN QSL card.

## KRMNPA meeting planned

A show and tell BBQ lunch day by those who are, or want to be, involved with the Keith Roget Memorial National Parks Award will be held this month. The idea behind the gathering is to share experiences at various National Parks, the ideal location to set up, and antennas to use with and without trees. The BYO BBQ will be on Sunday March 11, from 10 am to 12 noon at Churchill National Park – there is a BBQ on site. For more information contact Tony Hambling VK3VTH 0423 635 152 or [vk3vth@amateurradio.com.au](mailto:vk3vth@amateurradio.com.au).

## Repeater report

The Bass Hill repeater VK3RGS has had its battery and power supply fixed and is ready for use. Located in South Gippsland it gives a wide area of coverage.

Due to an interference problem it is proposed to swap the 70 cm frequencies between Arthurs Seat VK3RPU and Mt Macedon VK3RMM. This should also see the resumption of D-STAR from the Mt Macedon site.

With the drier weather, machine access has been achieved at the Mt Stanley VK3RN site for replacement of plant and equipment lost in the Black Saturday bushfires.

Work at the Waverley site for a relocated VK3BWI broadcast facility is slightly delayed awaiting permit approval.

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## GARC in the park

This is the premier event in the GARC's social calendar and was organised by Jenni VK3FJEN and Vanessa VK3FUNY at the Eastern Gardens Rotunda, Geelong.

Also in attendance were members of the Geelong Radio and Electronic Society, the GRES, including their President Bill VK3YTH. This is an annual event that has been in place now for several years.

## Hackers Space and back to fundamentals

Hackers Space has nothing to do with the disruptive activities of certain computer savvy people, but rather accommodating those individuals who derive satisfaction from DIY building 'things'. In an amateur radio context this might embrace microprocessor equipment such as SDR and similar activities; as it was decades ago when the commercial equipment that we take for granted today was either not available or far too expensive.

Lee VK3PK, who ran the clubs microprocessor group, has recently registered with the Hackers Group the fact that there is an interest in forming a group in Geelong with the GARC club rooms as a possible 'starting place'; this would provide a presence for those searching for Hacker groups in the greater Geelong area.

Allied to the above there is also recognition that fundamentals such as basic soldering skills and their application to, say, affixing coax cables to antenna connectors needs resurrection and Jenni VK3FJEN is organising classes at the GARC to that end.

The WIA recently broadcast that CQ magazine will introduce a quarterly Maker Column. 'CQ says



Photo 1: GARC in the park.

that the goal of this column is to help build and strengthen bridges between the amateur radio and the Maker communities'.

## Spring Field Day with Team VK3ALB/p

Once again VK3ALB/p ventured to Mt Leura for the Field Day. The weather was better than it has been for the last couple of years and they were able to hear VK2, VK4 and VK5. Best microwave distances achieved were to VK5SR at 234 km, VK3WRE at 298 km and VK3UHF on 24 GHz at 95 km. The best two metre contact was to VK5ACY at 486 km with 5x9 signal reports being exchanged.

The big improvement for the team this year was the addition of 24 GHz to the station. Peter VK3APW brought along his magnificently engineered 24 GHz Kuhne system. An initial contact with VK3UHF, the LUMEG team, at 0427Z was difficult, with heavy QSB making it tough going although signal peaks of 5x1 were exchanged. Later in the day conditions improved significantly and at 0757Z and 1110Z 5x5 reports were exchanged. Ironically, minutes after their last contact for the Field Day log, conditions radically improved with signals then peaking well over S9!

Photo 2: Peter VK3APW on 24 GHz contacting Charlie VK3NX



# Spotlight on SWLing

Robin L Harwood VK7RH  
e: vk7rh@icqmail.com



Well it is almost autumn and the days are drawing in after a particularly hot summer here in northern Tasmania. Propagation has been disturbed with several major coronal mass ejections (CME) in late January. This caused major disruption and more are predicted.

Another major shortwave station has departed HF for good. At 2200 UTC Radio Bulgaria in Sofia turned off their senders and stated they were going to dismantle them quickly. They have opted for the internet as a delivery platform and were not swayed by the chorus of protests against leaving shortwave. It indeed is a pity as I personally liked the distinctive music style of Bulgaria. This leaves its neighbour, Radio Romania in Bucharest still on shortwave but for how much longer? Greece and Turkey also border Bulgaria and they are still on shortwave, although Athens has cut back their transmission hours. Radio Netherlands in Hilversum will be gone altogether by October of this year, which leaves the Spanish Foreign Radio in Madrid one of the few remaining European HF broadcasters.

A friend in the States pointed me to a link on YouTube, which is extremely interesting. It is of the various OTHR signals on shortwave and how to identify them. I naturally assumed the majority of the pulses I was encountering came from Akrotiri in Cyprus. Not so, and many are located in arctic or sub-arctic regions.

You can find the link here, <http://www.youtube.com/watch?v=e43rXZPPhs&feature=youtu.be>. Not only does it have OTHR but other modes such as CODAR and even radiosonde, which is common. I am certain it will be of assistance

especially to Intruder Watch monitors. Note the video does not have examples of the prevalent Chinese system which has lately plagued the 40 metre DX window.

Myanmar has again reappeared on 7110, making it an intruder. It starts to come in around 1030 and it is my opinion that they have deliberately chosen the channel to get away from other signals. It comes as no surprise that there are no amateur stations in that nation so as far as they are concerned the frequency is vacant. The same station has a second programme on 5985 but on two separate transmitters. One is at Yangon (Rangoon) and the other is in the newly constructed capital city of Naypyidaw which is 320 kilometres away and off-limits to foreigners. One sender is 800 Hertz higher than the other and theoretically you can determine which sender is in operation by the frequency offset. The 7110 sender is at least 100 kW which explains its consistent signal level. The 5985 signal is certainly not as strong.

Don't forget that the A-12 period commences on Sunday 25 March at 0100. That coincides with the time when Europe goes on to Daylight Saving Time. Note that Russia and the CIS will not be advancing their clocks as they decided to permanently advance their clocks when Europe reverted to Standard Time at the end of October 2011. NSW, Victoria, Tasmania and South Australia revert to Standard Time on 8 April, as does NZ. America advances their clocks on 17 March, St Paddy's Day!

Well that is all for now. Keep monitoring as there are always surprises on the bands.

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# Our Noisy World

Bill Isdale VK4IS  
e [vk4is@wia.org.au](mailto:vk4is@wia.org.au)

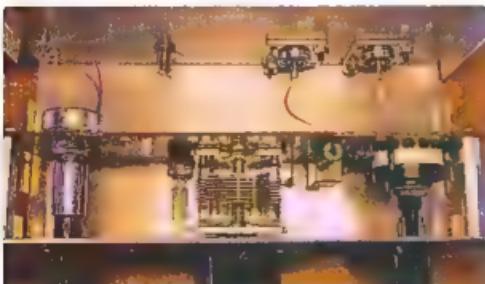


Photo 1: The variable bandpass filter has a selection of inductances and a variable capacitor.

From my QTH in a city it has been unknown for me to operate on 80 metres without having to contend with QRN varying from S3 to well over S9. Using 80 metres at night when the ionosphere will reflect the signals more or less directly down should allow the operator to enjoy nets with others who may be from a few tens to several hundreds of kilometres away. Such relatively local stations produce a strong signal environment but listening can often be quite unpleasant when the station being listened to is packed in not just the background QRN from distant lightning but also intense local noise, often from consumer electronic devices.

In an attempt to reclaim the pleasure of the experience of amateur radio, I have struggled with the noise. I hope that the description of my endeavours will help others to find a solution that works for them at their QTH.

Firstly, the antenna system. Having learned that most of the radio frequency noise created by us humans is vertically polarised, I ceased my experiments with a vertical antenna. I had been using a shortened vertical designed for mobile use mounted at about 5 metres, with radials. Although presenting a 36 Ohm load, it was only a few percent efficient and a

magnet for noise. The net result of the low antenna efficiency and the fact that most operators would be likely to be using a horizontally polarised antenna on 80 metres was that I had a very small presence on that band.

After realising the error of my

ways, I built a more serious antenna. A full size dipole with a 1:1 current balun suspended at 10 metres from a tree and fed by RG-213 coax. Space constraints meant that the ends had to be turned to follow my property boundary once the limit of its width was reached but the improvement could only be described as spectacular. I was there with a big signal. My 100 watt transceiver was able to release its potential. There was no need to use an antenna tuner as the antenna was cut to the correct length. I could be heard but there was still a lot of noise.

Having had some success with this really very inexpensive upgrade to my station, which delivered a huge improvement for about \$100, I was motivated to try for more. Impressed by the broad HF coverage of the OCF (off-centre fed) dipole I erected one with a 1:4 current balun and hung it just below the dipole. From some experience building Yagi antennas for 2 metres, I decided that it is so hard to get energy to couple into a wire when you want it to that I was not

going to be put off this experiment by fear that the new antenna might interact adversely with my successful dipole. I put the coax up just below the line feeding the dipole and had another antenna to experiment with. Using an inexpensive but effective manual antenna tuner it works very well on multiple bands. It is the correct length for a dipole on 80 metres and is simply connected to the feed-line at a point where the impedance is not ideal, but is not bad, if operated on multiple bands. An antenna tuner easily smoothes the transition to the transceiver.

With this antenna I am able to work HF successfully but have found that the dedicated dipole is a little better for 80 metres.

Noise remains a problem with this arrangement although I am definitely able to be heard and have made contacts around the world on 20 metres.

Unfortunately, trying to listen through the noise is a disincentive to working HF as it does produce fatigue. Rather than accept this situation, I have sought more targeted ways to reduce the noise. The addition of an external DSP audio processor between the radio and my headphones has brought a significant improvement. Although my radio has DSP in its audio stage, this dedicated device is



Photo 2: This high pass filter can be used above 3.5 MHz. Models with a 1.8 MHz cut-off are available.

quite powerful and takes a lot of the remaining noise out.

Experimenting with the many settings available with my Yaesu FT-857D brought the discovery that activating the attenuator and taking 10 dB off the incoming signal seemed to reduce the noise more than the signal, making the signal a good deal more prominent. A moment's reflection suggests why this might be so. The signals on 80 metres are mostly quite strong and the radio was able to perform better when not pushed into overload and desensitised by the power of the incoming signals.

This brought a further realisation that the enormously powerful local AM stations might be having an effect on the front end of my transceiver, which is designed to also receive that band. The 198 metre mast of the local Broadcast Australia 50 kW transmitter is clearly visible about 12 km away and with my antenna 40 metres long, it must be picking up the strong AM signals

transmitted from relatively nearby. That facility was commissioned in 1935 and its current transmitters date from the mid 1990s. It is not going anywhere anytime soon, so I would have to find a way to get along with it. I decided to experiment by notching out the AM broadcast band.

One possibility was to use a magnetic loop antenna. A small transmitting loop has a very narrow bandwidth so will operate as an effective barrier to off-frequency signals. It will not be very efficient for transmitting precisely because it is so small so I put this interesting idea aside for the time being. Using the antennas already up, I added an adjustable inductive-capacitive filter that I could use anywhere on HF, choosing it simply because it would be so versatile. Inserting this in-line right before the radio reduced the incoming signal, but reduced the noise a lot. The reduction in signal strength by about 5 dB has not been a problem on 80 metres when it was

necessary to do that anyhow and by passing only the part of the band to which it is tuned, I have found that the local 50 kW transmitter can barely be heard when I tune my radio to it, while leaving the filter set for operation on 80 metres.

This led me to introduce a high pass filter with high attenuation below 3.5 MHz as a permanent part of the station, as it has quite low loss, about .35 dB on the amateur bands. Such a filter is able to be conveniently transmitted through, which is simpler than the MFJ brand variable unit which has a line from the transmitter to trigger a relay to bypass it while transmitting. While this works reliably it does involve some complexity. Both units perform very well and help the radio deal with the local environment.

The steps I have taken have led me to an acceptable solution to my noise problem and hopefully may be useful for others in similar circumstances.

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# AMSAT

David Giles VK5DG  
e: vk5dg@amsat.org



## It's all a question of timing

The day after I sent off last month's column the good news came through that the Japanese ground station had successfully commanded FO-29 on. I have listened a few times during the last month and have heard the beacon each time. This month has news on new satellites and a clever approach to antenna construction.

## VEGA

ESA's new launch vehicle, Vega, will have had its maiden flight during February. As I write it is still on the launch pad, so here is just a quick summary of what is on board. Next month I will have another report on whether it was successful or not.

Vega will be carrying eight student-built satellites using amateur radio [1].

ALMASat-1 from the University of Bologna, Italy, is a 12.5 kg satellite with a nitrogen thruster. It will have downlinks of 1k2 FSK on 437.465 MHz and 38k4 FSK on 2407.850 MHz. [http://www.almusat.unibo.it/02\\_projects/almusat-1/almusat1.htm](http://www.almusat.unibo.it/02_projects/almusat-1/almusat1.htm)

e-st@r from the Politecnico di Torino, Italy, is a 1U size cubesat that will test an attitude determination and correction system. That is, it will orientate itself by using magnetorque coils. It will have a 1k2 AFSK downlink on 437.445 MHz. <http://areeweb.polito.it/ricerca/E-ST/>

Goliat from the University of Bucharest, Romania, is a 1U size cubesat with sensors for radiation

and meteorites as well as a camera. 1k2 AFSK downlink on 437.485 MHz.

MaSat-1 from the Budapest University of Technology and Economics, Hungary, will test various satellite subsystems. The website has software to demodulate and decode the telemetry using a PC soundcard. Its downlink of CW and GFSK is on 437.345 MHz. <http://cubesat.bme.hu/en/>

PW-Sat1 from the Warsaw University of Technology, Poland, will attempt to destroy itself by using a sail to slow down and thus de-orbit sooner than the other cubesats. PW-Sat has CW and BPSK telemetry and can be used as a voice transponder. Downlink is on 435.020 MHz and uplink on 145.9 MHz. <http://tinyurl.com/CubeSatPW-Sat>



## AMSAT-VK

### AMSAT Co-ordinator

Paul Paradigm VK2TXT  
email coordinator@amsat-vk.org

### Group Moderator

Judy Williams VK2TJU  
email secretary@amsat-vk.org

### Website

[www.amsat-vk.org](http://www.amsat-vk.org)

### Group site:

[group.amsat-vk.org](http://group.amsat-vk.org)

### About AMSAT-VK

AMSAV-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station,

Earth-Moon-Earth (EME), monitoring weather (WFO) satellites and other spacecraft. AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

### AMSAV-VK monthly net

### Australian National Satellite net

The net takes place on the second Tuesday of each month at 6.30 pm eastern time, that is 0930 Z or 1030 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making "skeds" and for a general "off-air" chat. In addition to the EchoLink conference, the net will also be available via RPTT on the following repeaters and links.

#### In New South Wales

VK2RMP Maddens Plains repeater: 146.850 MHz

VK2RIS Saddleback repeater: 146.975 MHz  
VK2RBT Mt Boyne Repeater on 146.875 MHz

#### In Queensland

VK4RIL Laydrey repeater on 147.700 MHz

VK4RRC Redcliffe 146.925 MHz IRLP node 6404, EchoLink node 44668

#### In South Australia

VK5TRM, Loxton on 147.125 MHz

VK5RSC, Mt Terrible on 439.825 MHz IRLP node 6278, EchoLink node 399996

### In Tasmania

VK7RTV Gawler 8 m. Repeater 53.775 MHz IRLP node 6124  
VK7RTV Gawler 2 m. Repeater 146.775 MHz IRLP node 6616

### In the Northern Territory

VKGMA Katherine 146.700 MHz FM

Operators may join the net via the above repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9558. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email. Frequencies and nodes can change without much notice. Details are put on the AMSAT-VK group site.

### Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM "repeaters in the sky" with just a dual band handheld operating on 2 m and 70 cm. These easy to use and popular FM satellites will give hams nations, communications and handheld access into New Zealand at various times through the day and night. Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.

**Robusta** from the University of Montpellier 2, France, will have a 1k2 AFSK downlink on 437.325 MHz. A 20 second frame of data is sent every 3 minutes.  
<http://www.ies.univ-montp2.fr/robusta/satellite/?lang=en>

**UNICubeSAT** from the University of Rome, Italy, will measure atmospheric drag. The low perigee of the Vega launch (~350 km) allows this to happen. It will have 9k6 FSK downlinks on 437.305MHz or 437.345MHz.  
[http://www.gaussteam.com/index.php?option=com\\_content&view=article&id=97%3Aunicubesat&catid=36%3Aunicubesat&Itemid=145](http://www.gaussteam.com/index.php?option=com_content&view=article&id=97%3Aunicubesat&catid=36%3Aunicubesat&Itemid=145)

**XaTcobeo** from the Universidade de Vigo, Spain, has a software defined radio, deployable solar panel and radiation detector. Downlinks on 437.365 MHz FFSK with AX.25 and 145.940 MHz.

<http://www.xatcobeo.com/>

Vega will launch these satellites into an elliptical orbit with an apogee of 1450 km and a perigee of 350 km. This will give an operational life of one to three years due to the low perigee.

## Other satellites to look out for during 2012

AMSAT-UK's FUNcube-1 has been scheduled for launch during the third quarter of 2012 on a Russian DEPNR rocket. FUNcube-1 is an educational satellite and will have a mode U/V linear transponder. Also on the same launch will be Triton-1, Triton-2, UKube-1 and Delfi n3Xt. Triton-1 is a 3U size cubesat with two mode U/V transponders. Triton-2 is also a 3U size cubesat with a mode U/V transponder and a mode U/S transponder. UKube-1 will have a similar mode U/V transponder as FUNcube-1. Delfi n3Xt is the successor to DO-64 and will have a mode U/V linear transponder.

## RS-39 Chibis-M

On 25 January after unloading supplies to the International Space Station, the Progress M13-M cargo ship was sent to an altitude of 500 km. There it deployed a 40 kg satellite called Chibis-M before firing its rockets once more to cause it to de-orbit. Chibis is Russian for 'Lapwing', the -M is short for Molniya which translates

as 'Thunderstorm'. Its mission is to 'study the interrelation of the transient plasma-wave processes connected with the manifestation in the ionosphere of solar-magnetosphere-ionosphere-atmosphere connections and the parameters of space weather. The fundamental goal is the search for universal laws governing transformation and dissipation of plasma-wave energy in the magnetosphere-ionosphere system' [2]. Simply put - it was found from other space missions that high altitude thunderstorms create large pulses of energy in the form of gamma, X-ray and radio waves. Chibis-M will be used to study these phenomena over its expected life of two years.

RS-39 carries instruments covering better than DC to daylight - a ULF/VLF receiver (0.1 to 40 kHz), HF/VHF receiver (20 to 50 MHz), optical camera, UV, X-Ray and Gamma ray detectors. All very good and hopefully add to our knowledge of the ionosphere. But where do amateurs fit in? Like RS-30, RS-39 has two CW beacons on 435.315 and 435.215 MHz giving telemetry on the spacecraft. High speed phase modulated data may also be transmitted. Also like RS-30 it does not have a transponder. Early telemetry reports received from amateurs showed RS-39 had a loud and clean CW signal. The telemetry also showed the battery voltage was low and the transmitter was turned off by the command ground station. RS-39 has flat solar panels that need proper orientation using three-axis stabilisation to get full power. The telemetry has been turned on again to confirm that RS-39 has better orientation. To help with the mission (and get a QSL card) you can email any telemetry received to [amateur-  
rs39@chibis.cosmos.ru](mailto:amateur-rs39@chibis.cosmos.ru) For the latest news, the main website is at <http://chibis.cosmos.ru/> but it is in Russian.

Mike Rupprecht DK3WN has written a telemetry decoding program for RS-39 and is available at <http://www.dk3wn.info/files/rs39.zip>

## SO-67 not recovered

News has come through about SumbandilaSat SO-67. Its primary mission is over. There have been enough on-board failures that it can now

no longer take high resolution images. A solar storm damaged the power supply to one of the stabilisation wheels and its cameras. However the amateur transponder is probably fine. Hopefully they will be able to get SO-67's transponder running again. South Africa has plans for future satellites including a successor to SumbandilaSat [3].

## Portable antenna

And now for a different approach to portable antenna design. The 2 m/70 cm portable Yagis such as the Arrow antenna have proven popular and are used on a regular basis for the FM birds. There have been plenty of variations homebrewed as well. In the January 2012 issue of QST magazine an article by John Fortune W6NHC describes the construction of an antenna with three elements on two metres and five elements on 70 cm. The design uses PVC tubing for the boom and tape measure elements. The elements fold up and booms twist for easy storage or transportation. Originally it was just a two metre version for hidden transmitter hunts. For those of us who do not have the QST magazine, the article has been made available on Clint Bradford's K6LCS site at <http://www.work-sat.com/Work-Sat/Antennas.html>

## Final pass

If you follow RS-39 on your tracking program you will see what the footprint would be like if the ISS was 100 km higher. It seems that important events happen at the end of the month right when I am compiling this column. More often than not they appear just after. As I finish off for another month AMSAT-NA are waiting for news from NASA that Fox-1 has been accepted into their 'Educational Launch of Nanosat' program. If successful then NASA will cover much of the integration and launch costs and AMSAT will have to speed up construction. If not then Fox-1 will require more funding and have to find another launch.

## References

- [1] <http://www.uk.amsat.org/4180>
- [2] [http://events.eoportal.org/get\\_announce.php?an\\_id=10003641](http://events.eoportal.org/get_announce.php?an_id=10003641)
- [3] <http://www.uk.amsat.org/4076>



# Salvaging parts: what to take and how to use it

Peter Parker VK3YE

## Introduction

The escalation of home computing power and the phase-out of analogue television have made old PCs and TVs a frequent sight on kerbsides around the nation. TV antennas are also common, as householders (rightly or wrongly) upgrade to a 'digital-capable' antenna. This is nothing new – the same thing happened when valves replaced solid state, colour replaced black and white and CDs replaced cassettes and vinyl.

At the same time the number of outlets selling components has shrunk, as suppliers either shut or shifted to consumer electronics. Hardware stores are likewise fewer and further. And often one must buy several items when only one is required. Hence there is much to be said for having on-hand parts for a new project or repair, especially if they can be acquired for free.

## The hunt and appetite for 'junk'

Tighter regulations have reduced the previously open access to rubbish tips. However street collections are still alive and well, although practices vary by area. For example some councils hold them once or twice per year while others require residents to call for collection.

'Junk' can also be obtained from your own household, friends, hamfests, op-shops, garage sales or Sunday markets. Electronic stores sometimes have baskets of cheap returned or unserviceable items. Such broken items are normally uneconomic to repair but their components can still be useful.

Appetites for junk vary. Beginners will often take almost anything – their junk boxes are shallow and it is hard to refuse even a small desk lamp or portable CD player. However discrimination deepens with one's junkbox, knowledge, and, in some cases, marital status. And besides it is sporting to leave something for the next person.

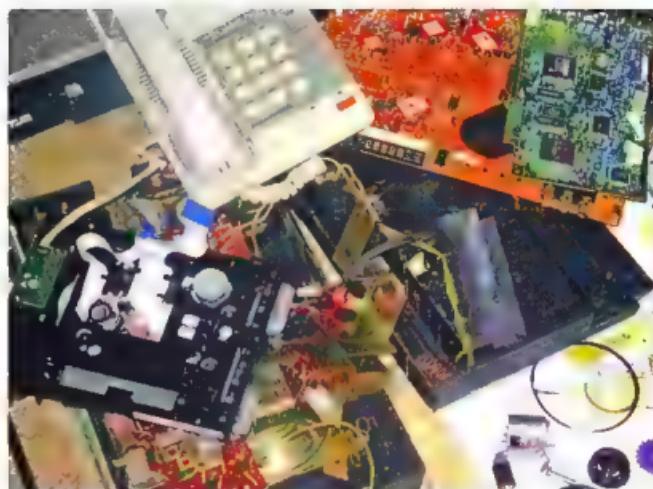


Photo 1: Circuit boards can provide a wealth of components.

## Knowledge and creativity

Ingenuity, or applied creativity, requires both knowledge and imagination. The successful salvager and builder has both traits.

It is vital to know the sorts of parts that future projects will need. And whether these will be found in particular items. Learning this requires study of circuit diagrams for various projects and experience gained from taking things apart.

Hence a field strength meter (which is about the simplest project for the beginner) will need a meter movement, small case, telescopic antenna, diode, variable resistor and RF choke. And an HF receiver will probably require tuning capacitors, coils, an audio amplifier and other small parts.

Looking at many circuits increases the likelihood of finding one that uses common components. As an example, a product detector in a receiver could be built with diodes, bipolar transistors, single gate FETs, dual gate FETs, prepackaged mixers or specialist ICs. The prepackaged

mixers and specialist ICs are unlikely to be found, but many designs use more widely available diodes and transistors.

It helps to know what parts are typically found in discarded gear. For example, a portable stereo will have a small power transformer, bridge rectifier, ferrite rod, tuning capacitor, audio IC and speakers. There could also be a small motor, potentiometers, knobs and assorted other parts. Similarly a home computer will probably contain a switchmode power supply, LEDs, crystals and a case. There will also be screws, sockets and a fan. Cordless phones, baby monitors and remote controlled cars have crystals, RF transistors and telescopic antennas, while a novelty toy could have a battery holder, LEDs and audio amplifier.

Other key skills include being able to identify components and read their values. While resistors are fairly similar to one another, capacitors and inductors vary considerably in appearance. Values are often given

as a numerical (capacitors and some inductors) or colour (resistors and some inductors) code. Reading codes saves hours of time compared to having to desolder and measure each one. Experience will also allow certain common ICs to be identified – for example, an 8-legged chip that precedes a speaker is likely to be an audio amplifier such as an LM386 or TDA2822, and a TO220 package screwed to a heatsink could well be a common voltage regulator or power transistor.

Imagination should be cultivated as much as knowledge. The trained eye often sees usefulness in items made for another purpose. For example a kitchen chopping board could be cut for antenna insulators, irrigation tubing for open wire feedline spreaders and a loaf tin for a project chassis or box. Baking trays provide metal that is expensive to buy in small quantities. The question to ask is not so much 'Is it useful?', but 'How can it be useful?'

Either abundance or scarcity can drive design. An impatience to finish a project without waiting for a mail-order can lead one to examine what can be built from the parts on hand. Often the experimenter will modify an existing design to suit available parts. The ability to make working substitutions (both at the component and stage level) is a mark of skill. Even the will to complete a particular

project may be strengthened as one finds (for example) a nice tuning capacitor, dial drive or handy-sized box.

### Tools

The salvager will need at least one soldering iron and a good solder sucker. I have found the metal cylindrical spring type better than the bulb type. However I doubt either would be any good if trying to remove tiny surface-mount parts.

A fine flat-bladed screwdriver (used as a pick or lever) is extremely useful for extracting components from the board. Long-nose pliers also sometimes help, but may break a part more often than fingers. Where leads are angled to be parallel with the circuit board (as was done with older equipment) it is often a good idea to straighten the lead (using a small screwdriver while applying heat) to allow the part to be pulled out with less pressure.

### Most valued parts

The most valued parts for the radio constructor are those that are widely used in projects but are either rare or expensive to buy. Attitudes and circumstances vary; those with more time than money will save every resistor and power cord, while the time-poor or well-stocked would keep only the rare parts.

The following gives a rough idea as to the least and most valued parts:

### Must-keep (hard to find or cost over \$10 new)

- Capacitors – particularly high-voltage, NPO ceramic, polystyrene or mica
- High-value compression or air-spaced trimmer capacitors
- Tuning capacitors (especially air-spaced)



Photo 2: Various fixed and variable resistors.



Photo 3: Various fixed and trimmer capacitors.

- Dial drums, drives and cords
- Crystals, crystal filters, oscillator modules and ceramic resonators
- Germanium and varactor diodes
- Large power transformers
- Valves and valve sockets
- RF power transistors
- Meter movements
- Good quality enclosures (especially metal)
- Good quality rotary switches

### Recommended to keep (not always obtainable or over \$2)

- Heatsinks
- Plastic boxes
- Sockets (especially headphone, microphone, antenna and binding posts)
- Ferrite rods and RF toroids
- RF chokes (these often look like fat resistors with a greenish body)
- Rocking armature earpieces (as in telephone handsets)
- Switches and potentiometers
- Known power transistors
- Known special-function ICs, for example, audio power amplifiers
- Voltage regulators
- Audio transformers
- Speakers and headphones
- Assorted hardware, for example, knobs, screws, nuts, washers, spacers
- Telescopic antennas



Photo 4: Various inductors and RF chokes.

- Old TV antennas
- Audio or RF shielded cable

#### Less important but still handy

- Small signal transistors
- ICs
- Resistors and trim pots
- Capacitors (ceramic, polyester, electrolytic, tantalum)
- Diodes (including silicon, zener and LEDs)
- Wire

#### Where to put it all

The case is often bulkier than the insides of modern electronics. If the case is not very useful (for example, a plastic cabinet from a cheap stereo), discarding it and keeping only the circuit board and speakers will save space. Undoing a few screws and some wire snipping is usually enough to free the circuit board.

Some prefer to remove all useful parts from the circuit board and then discard the board. These parts can be placed in cabinets with drawers. Alternatively food storage containers, preferably stackable with clear snap-lock lids, can be used.

Like modern dentists, I prefer to keep extractions to a minimum and leave parts in their original boards until needed. Circuit boards are flat and will usually fit in a storage cube (again preferably stackable). Keeping boards intact also protects the parts and may give some clues if a part's pinout is unknown.

#### Using the parts

Use of parts requires a synthesis between what a project needs and what is available. Otherwise one just accumulates components and builds nothing. It is worth reading as many

circuits as possible and examining salvaged parts to see if any could be useful. Google is a great resource for identifying obscure transistors and ICs; a search will often reveal data sheets and suggested circuits.

Sometimes it is possible to take short-cuts and modify equipment rather than build everything. For example the receiver portion of a 160 metre AM transceiver could come from a modified AM transistor radio. A converter could be added to an AM car radio to provide HF or VHF reception. Or the audio stages from a portable stereo could simplify a homebrew receiver, saving the need to make from scratch. Careful tracing of input, output and power connections and use of a hacksaw could even allow the circuit board to be cut to include only the needed stages. Again use of IC data can help important connections to be identified.

#### Conclusion

This article should assist would-be builders with few parts on-hand. Key themes have included knowing what items projects require and what is typically inside discarded items. And always asking 'How can it be useful' encourages the creative mindset that allows best use of available parts.

## Silent Key

John Baines VK7NJB

Tomas John Baines was born on 20 March 1934 and died on 18 November 2011.

John was licensed in 1988 and was a WIA member for a good many years. He was a keen operator on 2 m and 80 m, especially on the morning net on 3.615 MHz. In later years he was also active on 40 and 20 m.

One of his many interests was collecting and polishing rocks and minerals; his collection has gone to the Tasmanian Museum.

*Vale John.*

Contributed by Max Bowerman VK7MBP.

## Silent Key

Len Dimmick formerly VK7ZLD

It is with sadness that we inform you of the passing of Len Dimmick on 8 January 2012.

Len was active on six and two metres in the late 70s. He is remembered by many as a radio class lecturer at Hobart Technical College. He was a keen volunteer at Aurora Disability Services, also a dedicated Rotarian and was well respected in the Fijian community.

*Vale Len.*

Contributed by Ian Filby VK7ZIF and Justin Giles-Clark VK7TW.

# VK2 news

Tim Mills VK2ZTM  
e [vk2ztm@wia.org.au](mailto:vk2ztm@wia.org.au)

Pierce Healy VK2APQ became a Silent Key on 14 January, 2012. Pierce celebrated his 100th birthday in August last year. While Pierce had been involved in many aspects of the hobby it was the notes that he compiled for Radio and Hobbies for many years that most amateurs will remember. He was a Life Member of both the WIA and ARNSW.

Members of ARNSW are advised that with the AGM being held on Saturday, 21 April, 2012. The close of nominations, agenda items and notice of motions will be at 12 noon on Saturday, 10 March, 2012, a week later than notified in last month's VK2news. All paperwork

pertaining to the AGM will be posted to members this year; there will be no emails sent. Please make sure that your postal address is up to date with the Membership Secretary. You can check this by an email to [membership@arnsw.org.au](mailto:membership@arnsw.org.au) or telephone 02 9851 1490 or 0400 445 829 and leave your contact details. For other details see last month's notes. Check both VK2WI News and the ARNSW web site [www.arnsw.org.au](http://www.arnsw.org.au) for updates.

The upgrade course for Standard and Advanced licence grades commences at VK2WI Dural on the first Monday evening (the 5th) in March. There will be a one day

Foundation course on Sunday, 18 March and assessments held the following Sunday, 25 March, which is also a Trash and Treasure day. Information is available by an email to [education@arnsw.org.au](mailto:education@arnsw.org.au) or the phone numbers above. ARNSW assessors provided all grades of exams at the recent Central Coast field day.

The annual Urunga Convention will be held over Easter. The Oxley Region has advised that their June long weekend field day will be held again this year at the Tacking Point Surf Lifesaving Club Hall. There was no Radio Expo at Coffs Harbour this year.

73 - Tim VK2ZTM



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**See you at the Sewing Circle Barbeque held at Ross, Tasmania Sunday March 18**

*As always, you can get a free catalogue - just call!*

# Contests

Phil Smeaton VK4BAA  
e vk4baa@wa.org.au

## Contest Calendar for March 2012 – May 2012

Mar	3/4	ARRL International DX Contest	SSB
	10/11	RSGB Commonwealth Contest	CW
	17/18	John Moyte Field Day	CW/SSB/FM
	17/19	BARTG RTTY Contest	RTTY
	17/18	Russian DX Contest	CW/SSB
	24/25	CQ WW WPX Contest	SSB
April	1	<b>QRP Hours</b>	<b>CW/PSK31/RTTY/SSB</b>
	14/15	Japan International DX Contest	CW
	21/22	YU DX Contest	CW/SSB
	22	<b>Harry Angel Sprint</b>	<b>CW/SSB</b>
	28/29	Helvetica Contest	CW/SSB
	28/29	SP DX RTTY Contest	RTTY
May	14/15	CQ-M International DX Contest	CW/SSB
	7	VK/Trans-Tasman 80 metres Phone Contest	SSB
	28/29	CQ WW WPX Contest	CW

Note: Always check contest dates prior to the contest as they are often subject to change.

Welcome to this month's Contest column.

### RD Contest

The RD has had something of a chequered history as regards management and rule changes. There has been a modicum of debate recently on the VK Contest Club (VKCC) reflector pertaining to the issue, with opinions sought for improvements. Some of the suggestions have been plausible and some would require a magic wand to implement, but the overall opinion and depth of feeling is very clear: the RD is far from optimum and needs immediate attention.

With Peter VK4OD's recent resignation as contest manager for the RD due to ill health, a volunteer is sought to fill these large shoes. No doubt, by the time this gets into print a successor might well have been named and made public, but at this stage the contest is without a leader for 2012. I wish you a speedy return to full health Peter! (The WIA Board plans to appoint a new manager at its meeting on February 18 & 19. Ed.)

In no particular order or preference, suggested changes and opinions, to date, are as follows:

- The diggers were in the trenches, so there could be a category for portable field operation, with bonus points available for portable stations and QSOs made with them;
- Bonus points for stations operating from an historic military location;
- Special event callsigns which have some military significance could be distributed by WIA/ACMA. Bonus points for finding and working those stations;
- Run the CW section at a different time, even if it is not for 24 hours;
- One person using multiple call signs should be banned;
- State result should be the top ten scores taken from any category versus the top ten in each of the other states;
- Individual awards for various categories;
- No multi operators but any calls can operate from a club station;
- Limit transmission power to 100 watts;

- No repeaters of any type;
- Exchange should be a full report plus number plus first name;
- Adopt the sprint rule of moving after CQing;
- WWII equipment section should be dropped;
- Restrict CW to straight key only;
- Adjust scoring to accommodate the 'wee' hours and to promote band changes;
- Introduce high power, low power, F call sections;
- Delete VHF/UHF bands;
- Delete inter-state competition and make it inter-club instead? Or even Australia-wide, and;
- Remove not being able to work an HF Station in your own State.

The opinions/suggestions voiced on the VKCC reflector are neither definitive nor binding. The VKCC reflector is simply a forum for like-minded souls, so if you have any thoughts on the subject then do not hesitate to contact the contest manager once he or she has been appointed.

In my very humble opinion, the first thing is to decide what the contest is to achieve and what goals we have for it in the future. It seems to me that an almost continual changing of the rules to achieve the impossible, a level playing field, has confused the aims of the contest and even put people off participation. Contesting in VK is on the rise, generally, so the falling participation aspect seems to be contest specific. The contest was always intended to be a bit of relaxed competition between the states to celebrate the sacrifices made in the wars by fellow amateurs in an effort to preserve our freedoms. It developed over the years with various states getting annoyed the rules were not in their favour. Some really convoluted calculations resulted only to prove the level playing field is a mirage. So we seem to have the goal of a relaxed contest between states to commemorate sacrifice, but it is also a contest where we can all touch base with old friends.

For many, the RD Contest was their introduction to amateur radio so it is often described as a 'favourite' contest and talk of further changes will no doubt produce an emotive reaction from some. The General Rules printed in last month's AR have ruffled a feather or two apparently, so people are seemingly reticent to change. The rules were borne out of a group of contest focussed WIA Directors and the WIA contest managers, but they will not always

please everyone, regardless of intention. For the RD at least, we certainly need more participation and I am all for any changes that would see such an outcome. Without a major re-think, I suspect that the RD will ultimately pass into history as a lost opportunity for revival and ultimately fade into obscurity. The new manager is likely to need all the help he or she can get – but it is up to all of us to assist.

## CQWPX SSB 2011 Results

The following VK stations submitted a log in the WPX SSB contest in 2011. The bands were lively just for once and much is hoped for a similar level of activity for 2012. At the time of writing, solar flares are making HF into something of a wasteland, unless someone has installed a huge Faraday Cage over my antenna system! Congratulations to all that entered to put VK onto the world map during the contest.

## Last call for BERU 2012

Are you ready for the challenges of

Commonwealth Contest and the WPX CW this month? I ask the latter somewhat tongue-in-cheek, as my CW skills are still a mite rusty even after my faltering participation during CQ WW CW late last year – but at least they have moved on from what was originally described by fellow VK4KW team members as sounding akin to a goat standing on a corrugated tin roof.

VK will hopefully be entering a team or two for 2012 (no details unfortunately at the time of typing this wee ditty) but the contest is a single operator affair so no multi-op entries are permitted. Seriously though, I might be able to enter this year as the station antenna system is a bit more mature now and I can operate at my own CW speed and not feel the pressure to go faster.

Call	Category	Score	QSOs	WPX	Operator(s)
VK4KW	MULTI-TWO	26,528,482	5,756	1,389	VK4BA VK7ZE VK4TI VK4SN VK4NDX VK4DX
VK4NM	MULTI-ONE	6,133,875	2,072	825	VK4NM VK4LAT
VK2IM	SO HP ALL	3,786,880	1,508	640	
VK6NC	MULTI-ONE	2,897,063	1,406	703	VK6RK VK6AL VK6BEC VK6VY VK6WX VK6NU
VK4EMM	SO HP ALL	2,856,276	1,376	636	
VK6IR	SA HP 15M (T)	2,263,494	1,252	654	
VK2CA	SA HP ALL (T)	2,015,059	1,217	571	
VK3TDX	SO HP ALL	1,989,376	1,073	608	
VK1CC	MULTI-MULTI	1,608,491	956	563	VK2KDP VK2MCI VK2BD VK2CCC
VK4WIP	MULTI-ONE	1,252,649	876	509	VK4MIA VK4QS VK4MN VK4FAAT VK4HGB VK4RJ
VK3DOG	SO HP ALL (R)	212,930	293	214	
VK3AVV	SO HP ALL	189,200	277	215	
VK4VDX	SO LP ALL	168,696	265	213	
VK8FDX	SO HP ALL	141,038	267	194	
VK3MDX	SO LP ALL	116,272	212	169	
VK3TZ	SO LP ALL	109,210	204	163	
VK7NET	SO LP ALL	100,110	206	141	
VK2MBG	SO LP ALL	98,598	203	157	
VK4IU	SO HP ALL	81,780	202	141	
VK1OO	SA LP ALL	72,765	160	135	
VK4FJ	SO LP 15M	68,497	175	143	
VK3LM	SO LP ALL	65,142	150	141	
VK4XES	SO LP ALL (T)	63,512	147	138	
VK2BCQ	SO HP ALL (T)	63,384	164	139	
VK4DMP	SO LP 20M	56,823	150	141	
VK8HAD	SO LP ALL	51,528	165	114	
VK1MJ	SO HP ALL	39,710	106	95	
VK2WTT	SO LP 20M	38,976	123	116	
VK2ERP	SO HP ALL	30,694	121	103	
VK2ACC	SO HP ALL	29,302	105	98	
VK2WAY	SO LP ALL (T)	29,056	98	87	
VK1PAR	SO LP ALL	28,644	97	84	
VK4BL	SO LP ALL (T)	28,606	111	96	
VK4ATH	SO GRP ALL	22,532	99	86	
VK5MK	SO LP ALL	17,822	74	67	
VK2HRK	SO GRP ALL	12,201	55	49	
VK4MN	SO LP 20M (T)	5,625	45	45	
VK4QH	SO LP ALL	2,650	28	25	
VK3VTM	SO LP 20M (R)	2,052	27	27	
VK2HEK	SA LP ALL (T)	1,188	19	18	
VK1MAT	SO LP 20M (R)	225	9	9	
VK4FJAM	SO GRP ALL	48	6	6	
VK6PMAB	SO LP ALL (R)	40	6	5	
VK5FMPJ	SO LP 40M (R)	4	2	2	
VK5FCJM	SO LP 15M	3	1	1	
VK6WX	Check log				
VK7XX	Check log				

(R) = Rookie overlay category

(T) = Tribander/Wires overlay category

That's one of the fun parts of contesting - you can compete against a friend down the road, a station overseas, or just against yourself. The VK team members will need your callsign in their log for the points as long as you're in a different call area to them, so have a listen and give them a call if you hear a VK callsign calling 'CQ Beru' or 'CQ CC'.

#### CQ Awards

Shown in the photo is Steve VK3TDX, rightfully looking very pleased. The two CQ awards are for winning the



Steve VK3TDX with his two CW contest awards.

continent of Oceania in the CQ WW and CQ WPX RTTY contests of 2011. They are both very well deserved Steve - congratulations!

If you have any contest related material for inclusion within the column, topics that you would like covered or even some experiences and pictures you would like to share, then please feel free to get in touch via [vk4baa@wia.org.au](mailto:vk4baa@wia.org.au)

See you on the bands.

**73 de VK4BAA Phil Smeaton**



# WIA National Field Day 2012 Rules

National Field Day Coordination Team

## 1 Eligibility

The WIA National Field Day is open to all amateurs in Australia.

Stations residing in other regions may be contacted for credit, but are not eligible to submit entries.

## 2 Object

To promote amateur radio to the public, to engage potential amateur operators in amateur radio, and work as many stations as possible on any and all permitted amateur bands using a variety of modes. Please note that the event is not to be treated as a traditional contest. Clubs and individuals are encouraged to optimize their presentation to the public by participating in the scoring system.

## 3 Date and time period

The 2012 Field Day will commence at Friday, 13 April 2012 at 2300 UTC and conclude on Sunday, 15 April 2012 at 1100 UTC.

Stations that are operated for a period of more than 10 hours may only claim points for a maximum of one 10 hour period.

## 4 Entry categories

There will be two entry categories:

### 4.1 A Public Station

A group of amateur operators (which may be a club) operating from a public place, or at a club premise which is open to the public for the duration of the event, and use a single call sign. A Public Station may not be solely operated by an individual.

- Public Liability Insurance is highly recommended for all Public Stations.
- The safety of all participants and visitors to the station must be a part of the planning, operation and finalization of the station.

### 4.2 A Private Station

A station which does not fulfil the requirements of Public Station and includes an individual operation (including a portable or mobile operation, or operating from a private residence).

### 5 Location

Clubs or groups of operators participating in public areas will be responsible for obtaining any required permits or permission to operate at the desired place. It is recommended that an alternative location is considered during the

planning stages in case the preferred location is not available.

## 6 Regulations

All stations will be operated within the current ACMA rules and regulations.

## 7 Exchange

Stations are encouraged to log each contact. The exchange of a signal report via RS(T) and a three digit serial number commencing at 001 for each transmitter, mode or band used. This is to provide some flexibility for each station. True RS(T) reporting is to be encouraged as this will be more meaningful to the public.

## 8 Permitted modes and reworking

### 8.1 Separate bands

Phone, CW and each discrete digital mode (i.e. SSTV, PSK31, RTTY, MT63, etc.) on a band are considered as separate modes.

### 8.2 Reworking

A station may be re-worked and logged after one hour has elapsed from the previous contact on that band or mode. Stations may rework more frequently for demonstration purposes but points should not be claimed for these contacts.

## **8.3 Repeaters & Internet**

Repeater contacts and use of IRLP, D-STAR, and EchoLink are permitted, each of which will be considered a different mode.

## **9 Logs and evidence**

Logs and supporting evidence for bonus points must be received by the National Field Day Coordinator at the Wireless Institute of Australia, Unit 20, 11-13 Havelock Road, Bayswater, Vic 3153 by midday on Friday 18 May 2012. Logs may be mailed to Wireless Institute of Australia, PO Box 2042, Bayswater, Victoria, 3153.

### **9.1 Logs & receipt**

It is recommended that large logs and supporting evidence should be presented as a number of easily identifiable files on CD or DVD media. These larger logs may be delivered in person or via mail. Stations are recommended to keep a copy of all material forwarded.

The email address to be used for all queries or submission of logs and evidence is [nfd@wia.org.au](mailto:nfd@wia.org.au)

Large emailed logs or evidence has caused concern and issues in the past. Emailed logs and attachments are recommended to be less than 5 megabytes per emailed message. If broken into several messages, each message should be clearly marked in the title e.g. "Broken Valley Radio Club, NFD 2012 - 1 of 3".

### **9.2 Receipt of valid logs**

All valid logs received prior to the closing date, will be acknowledged via email to the nominated representative.

## **10 Scoring**

Scores are based on the total number of QSO points plus bonus points as detailed below. Stations will submit a summary sheet of the claimed points as a cover sheet of the log.

### **10.1 QSO points**

All contacts regardless of band or mode count one point each.

### **10.2 Bonus points**

The following bonus points will be awarded to Public Stations

#### **10.2.1 Non licensed operators**

Where a non-licensed, supervised person makes a contact or exchanges greetings via amateur radio at a Public Station and records their name and postcode in the log, an additional 50 points will be awarded for the first contact only made by that person.

#### **10.2.2 Participation**

Twenty points will be awarded for each amateur that assists in operating and/or promoting the activity at the station, and enters their name, callsign and the nature of their involvement in the logbook.

#### **10.2.3 Public locations**

Two hundred points will be awarded to a station which operates in a prominent public location (i.e. shopping centre, or adjacent to a public facility) – a supporting photograph of the station must be submitted with the log.

#### **10.2.4 Operational transceiver**

One hundred points will be awarded for each operational transceiver located at the station for which a log is submitted. Please note, multiple hand held transceivers operated at the station is not regarded to be in the spirit of the event and may not be used for the bonus points.

#### **10.2.5 Renewable energy**

Where the NFD station is substantially powered by renewable energy (i.e. solar, hydro, wind, human powered) an additional 200 points will be awarded.

Batteries may be deployed as part of these stations and charged from mains prior to and after the event. This is acceptable and will not exclude a station from claiming renewable energy points so long as the power load of the station is substantially provided by renewable energy.

#### **10.2.6 Non-renewable portable power**

Where the NFD station does not qualify as substantially powered by renewable energy but it is powered by a non-renewable portable power source (i.e. generator, batteries) and not connected to mains power, 100 points will be awarded.

Please consider safety in the configuration of the station power supplies and cabling.

A supporting photograph of the power source must be submitted with the log.

#### **10.2.7 Digital and non-voice modes**

Where a station operates and logs contacts using non-voice modes, 100 points will be awarded for each additional mode (EchoLink Text excluded as a non-voice mode for this bonus).

#### **10.2.8 Publicity**

Where a station operation is accompanied by publicity, the following points will be awarded:

##### **10.2.8.1 Public broadcast television**

Where the station is referred to on a non-amateur television station(s) – 200 points per reference.

##### **10.2.8.2 Public broadcast radio**

Where the station is referred to on a non-amateur radio station(s) – 200 points per reference.

##### **10.2.8.3 Public press**

Where the station is referred in a press publication(s) – 200 points per reference (Newspaper, magazine or newsletter generally accessible by the public).

##### **10.2.8.4 Visit by prominent invited guests**

Where the station is visited by an invited Government official (i.e. Member of Parliament, local government councillor, local mayor, local school principal or nominated representative) – 100 points per official. A supporting photograph of the station must be submitted with the log.

##### **10.2.8.5 Visit by emergency services staff**

Where the station is visited by an invited member of a community emergency service, preferably in uniform (i.e. CFA, SES, Coast Guard, Ambulance or Police) – 100 points per organization in attendance. A supporting photograph of the station must be submitted with the log.

### **10.2.8.6 Educational activity**

Where the station hosts a structured amateur radio educational activity for five or more children below the age of 18, (i.e. formal training, kit building, fox hunting, licence examinations) – 200 points.

Where the station hosts a structured amateur radio educational activity for five or more adults over the age of 18, (i.e. formal training, kit building, fox hunting, licence examinations) – 100 points. A supporting photograph of the station and description must be submitted with the log.

### **10.2.8.7 Public information brochures**

Where the station provides a public information table to promote amateur radio – 100 points.

### **10.2.8.8 Presentation material**

Where the station submits photographs, or a video or a print press articles describing the activities of the Field Day operation at the station – 50 points will be awarded for each type of presentation submitted up to a maximum of 150 points.

Please note, video presentations have proven difficult to use as previous quality and format offered has proven difficult to reproduce quality images. Video images should not be the sole form of evidence offered. Quality still photos are preferred.

## **11 Awards**

### **11.1 Registration**

In order to be eligible for an award the station must have registered as a participant on the WIA National Field Day web site prior to commencement of the event.

### **11.2 Submitted valid log**

All registered participating clubs who submit a received log prior to the closing date, will each receive a participation certificate.

### **11.3 Private Stations**

All registered Private Stations who submit a received log prior to the closing date will each receive a participation certificate.

### **11.4 Outstanding efforts**

#### **11.4.1 Public Stations**

The three highest scoring Public Stations will be acknowledged in AR magazine and on the WIA web site.

#### **11.4.2 Private Stations**

The three highest scoring Private Stations will be acknowledged in AR magazine and on the WIA web site.

### **11.5 Review**

The WIA National Field Day Coordination Team will review valid logs, photographs etc. received based on general appearance and presentation of participants, location and equipment layout. Claimed scores may be adjusted and advice will be offered to the station if this is done.

### **11.6 Publication of material**

Recommendations of reproduction of suitable material will be made to the Editor of AR and the WIA Webmaster.

### **11.7 Miscellaneous**

#### **11.7.1 Acceptance of Rules**

By submitting an entry you agree to be bound by these rules and published guidelines regarding safety and insurance. Furthermore, you agree that the judge's decision on the interpretation of the rules awarding of points (including bonus points), certificates and awards will be final and that no correspondence will be entered into in this regard.

#### **11.7.2 Copyright**

The copyright in all material submitted must be held by the submitter and the WIA is expressly authorized to use the material for promotional purposes. Copyright of all provided material and images will be deemed to have been released to the WIA for publication unless specifically requested to be not for publication.

#### **11.7.3 Images of minors**

Images taken or offered of minors should be accompanied with specific parent or guardian's consent (e.g. a signed notation in the log book). Images of minors may be deemed by the WIA or other interested parties as not suitable for publication.



# **VK6news**

*John Ferrington VK6HZ*

Some news from the MidWest Amateur Radio Group. Matt VK6MRG and Rick VK6XLR have been very busy over the past six months on an APRS mini iGate project. Matt had been looking for a low cost standalone iGate to eliminate the use of a standard PC, and a low power consumption device would be perfect for solar powered sites. After much searching he found a website by Andrew Quinn ZL1WJQ

that transformed a cheap D-LINK DSL-502T ADSL router into a receive only iGate. Matt contacted Andrew and shortly thereafter had a DSL502 iGate up and running.

Matt and Rick decided to build a few units from the ground up along with firmware help from Andrew. Over a couple of months a new PCB layout was designed for the miniTNC that resides inside the router. The PCBs manufactured in Asia are

double-sided, solder-masked and silk-screened. Quality is superb. Once the PCBs were populated with components and the routers modified, new firmware was flashed into both the miniTNCs and DSL502Ts. With a little reconfiguration, we now had our own 502Gates up and running. Currently six 502Gates are operational throughout VK6 with several more to come online within the next month or so.

MWARG now has LIVE aircraft and ship tracking available that shows what is happening in the Mid West's skies and seas. The aircraft feed is sponsored by AEGWA (Aircraft Enthusiasts Group of WA). It provides coverage to about Denham (Shark Bay), some 800 km north of Perth, filling the current void along the west coast. It is hoped that both Planeplotter and Planefinder users find it useful for tracking aircraft movements along this stretch of WA coastline. Further details can be found at the MidWest Amateur Radio Group website [www.mwarg.org.au](http://www.mwarg.org.au)

Thanks Rick. Over to Bill at HARG.

Hello from HARG with a quick summary of the last four months of 2011. We have now presented two of our monthly Technical Talks. 'Software Defined Radio' was presented by Richard VK6BMW in September and 'Data Modes' by Steve VK6ST with assistance from Heath VK6TWO in October. Also in October we operated JOTA for the Guides with whom we share our clubrooms and next year we hope to repeat this with the addition of a simple electronic construction project or a fox hunt.

Our inaugural 'Show and Tell Day' was held at the November meeting. Six members showed their favourite bits and pieces including an ESR Meter, recently built by Bill VK6WJ, a vertical HF antenna system made by Onno VK6FLAB and a home brewed portable Slim Jim and 5/8 wave two metre mobile antenna from Alan VK6PWD. Richard VK6BMW showed his 60 year old 1000 watt Navy power meter, Meg VK6LUX demonstrated her hand held satellite antenna and Ronald VK6FRSK showed his four element two metre Quad made from copper wire threaded through poly pipe - not

the most beautiful thing in the world but very quick and easy to build.

In December we organised a HARG table at the TET-Emtron Open Day and received several applications from prospective new members. Our final meeting for the year was our Christmas Barbecue on Saturday 10 December. We started off with hot dogs at lunch time then played with a satellite dish and receiver during the afternoon and finished off with delicious fish and chips in the evening. I think we must have the most versatile barbecue in WA - and it seems to stay really clean!

This year we will continue with our monthly technical talks and I will announce the subjects in the VK6 News section of the weekly WIA broadcasts.

73 and best wishes for 2012 from Bill VK6WJ, Publicity Manager - HARG.

Thanks Bill. Now, to Keith VK6RK at NCRG for an update.

The NCRG would like to thank all those amateurs who attended our Open Day/weekend on Saturday 14 and Sunday 15 January. It was nice to see some new faces and meet some old ones again. Thanks to Joe VK6BFI for his usual delicious Italian food, and all other members who



Richard VK6BMW operates HF for the Guides during JOTA.

turned up to operate and give conducted tours of the site!

The weekend of 4 February will see the raising of our monster 'G' tower and the rearrangement of the other towers around the site. This will give us a better operating system with HF monobanders no longer firing into each other at similar heights. Work has also commenced on our 80 metre four square antenna and improvements are planned for the 160 metre vertical. The club's 70 cm repeater

will also be installed at this time to allow club members to chat with a greater range than at present on our preferred two metre FM frequency.

The weekend of 15 January also saw the end of the WIA News re-broadcasts from the club. It was felt that the service we have provided for the past 26 years was no longer needed on 40 metres, and the 80 metre broadcast was not well supported, so a decision was made to cease transmissions. We have no intention of dismantling the news equipment, just mothballing it should it be needed in the future. Best wishes to all for 2012.

In early January we were informed of the passing of Don Graham VK6HK. Don died peacefully at home surrounded by his family, after a short illness. Vale Don.

See SK notice on page 45.

73 Keith VK6RK for the NCRG news. Busy times in VK6!

Well, that is it from VK6. If you have anything to contribute, please email me [vk6hz@wia.org.au](mailto:vk6hz@wia.org.au)

See you next month!

de John VK6HZ



# Tunnels in the sky?

Joseph Kasser G3ZCZ, VK5WU and 9V1CZ  
e\_jkasser@iee.org

Over the last 40 years I have noted what seems to be an anomaly. When the HF bands (1) are open there seem to be missing stations. So where are the missing HF stations?

## Observations

In general non-contest operations when the band is open to a specific DX location, for example Adelaide, South Australia to the UK, only one or two stations from that DX area can be heard. The same phenomenon has been noted in contests; when the band is actually open to a DX area only one or two stations from that area could be heard. I have always put that down to the fact that there was a lack of activity at the other end. However, in the October 2010 SSB contest, the 20 m band was open to Europe from Singapore (my location) at about 1430 Z, the DXCluster showed DX spots announcing the activities by a number of stations in England, and a couple of stations in Ireland, yet when I tuned to those frequencies (my software can tune to the DX frequency spot automatically), none of the stations except for EI2CN could be copied. Why was EI2CN the only station that could be heard and contacted for 15 minutes or so? He was S9, so where were the weaker stations? Why couldn't the other UK stations that were being spotted on the DXCluster at that time be heard?

In both Australia and Singapore, there are few local stations (2). If you look at the great circle plot of Earth centred in turn on Adelaide, South Australia, London, Washington DC and Singapore you will notice that the radio amateur population is such that when the bands are open to short skip, there are many locals to work. In Adelaide and Singapore that is not true. There are so few stations that there is often nobody to contact unless the band is open to DX. For example, operating from Adelaide over the first decade in this century, the VK6RBP and ZL6B 20

metre beacons could be heard at many dB over S9 with one other station on the entire band (CW or SSB). Sometimes, calling CQ automatically for 30 minutes at a time resulted in no contacts. The local noise level was often as low as S1. In fact, when the band was open under poor conditions DX stations at S3 or so who were not able to hear me because of their local QRM or QRN levels could be heard (3). When conditions were good, different stations at various signal strengths could be heard.

Short wave radio propagation theory purports that the ionosphere reflects like a mirror. Different frequencies get reflected different distances at different times of day. There are times when there is no propagation between two locations and there are times when there is propagation. When there is propagation, the ionosphere acting as a mirror should reflect all the signals between the locations. However, when the band is actually open, not when predicted to be open, the stations that should be audible, since my receiver and antenna let me hear weak stations, are not being heard.

## Analysis

The following aspects of the situation were considered.

- **My receiving set up.** I have generally been lucky and have had low local noise and can hear much further than I can speak as discussed above (4). I spend a lot of time listening and tuning. Occasionally I have worked weak stations that showed up on a frequency for a few minutes and then faded away.
- **Good and poor conditions.** The situation has been more or less the same through the last 10 years, 2000-2007 in Adelaide and 2008-2010 in Singapore.

## The geometry of the path.

The stations in the DX area may have had their beams edge on to Adelaide and Singapore; so yes, the signal levels would be down. However, since the local noise level is low, and I can hear weak stations, many of those stations not beaming directly at me should be heard at some weak signal level. In addition, stations not using beams ought to be audible. A typical three-element Yagi beam used by many radio amateurs on the 20 metre, 15 metre and 10 metre bands can have a front-to-side rejection ratio of 36 dB. If all the missing stations were beaming edge on, that would put their received signals 6 S units down as shown in Table 1 below. If one station booming in at S9+ can be heard, stations down to S1 and 2 should be audible and the other stations from that area should be heard. Operating during a contest from a location in Europe or North America, hearing stations at those low levels is often impossible (5). However, in Singapore and Adelaide hearing stations at S1 is no problem. Copying SSB voice at S2 is a breeze (6).

dB	Change	S units	Received reports
0 dB		Reference	1024 Watts = S9
3 dB	x2		
6 dB	x4	-1	256 Watts = S8
9 dB	x8		
10 dB	x10		
12 dB	x16	-2	64 Watts = S7
15 dB	x32		
18 dB	x 64	-3	16 Watts = S6
20 dB	x 100		
21 dB	x 128		
24 dB	x 256	-4	4 Watts = S5
30 dB		-5	1 Watt = S4
36 dB		-6	0.25 Watt = S3

Table 1 Power to signal strength relationships

- The relative signal levels. I am running low power; they may be running various power levels. But I am not discussing them hearing me; I am discussing my not hearing them. My receiver ought to have heard them as shown in Table 1 and discussed above.
- The frequency. It seems to happen on 10 metres through 40 metres. I haven't seriously operated on 80 and 160 metres, so have no data.

**The way people operate.** The serious contestor in Singapore and Australia who spends most of the time calling CQ would probably not notice this phenomenon; he would respond to the strongest stations and assume that the missing stations were either not there or too weak for him to hear them. Other stations who tune for contacts might not notice the same phenomena if they do not have Internet DXCluster information.

- Why the issue has not been mentioned before. Digging through memory I do seem to have noticed the same thing operating from Silver Spring, MD (W3), England and Jerusalem (4X) over the years. I would tune the bands and hear only a few stations from one area (7). But from 1970 to 1990 I had no way to know if there were more stations active than those I could hear. By the early 1990s there were PacketClusters and then Internet DXClusters. And there was software that could tune the transceiver to the DX spot frequency. Operating from Silver Spring, MD, stations that were spotted by other East Coast stations were generally receivable. This just told me that I could hear the same stations that others were hearing. At that time, we had no way of knowing if any DX stations were transmitting and not being heard.

Serendipity struck. In my professional life I teach systems engineering. I needed to teach students how to create software models, test the models and put them together to make a simulation.

For that I needed a case study to use as an example where I could take the students through the whole system development lifecycle from conception to operation. I dug out a software simulation of the American Radio Relay League (ARRL) 1977 Sweepstakes contest that I had written 30 years ago (Kasser, 1984). The software contained five models that determined if a contact could be made with a specific ARRL Section at specific times of day; propagation of HF signals being but one of the models. Creating the lecture reminded me of these observations. And, by some coincidence there was an article on HF propagation in the December 2010 issue of QST (Nichols, 2010) which cited an earlier article (QST, 1940) which summarized the Bureau of Standards Letter Circular-575, an up-to-date [for 1940] summary of known ionosphere effects. I dug out the 1940 article to see if it could shed any light on my observations (8). The following issues appeared to be pertinent:

1. The ionosphere, located between about 50 and 500 kilometres above the surface of the Earth, can reflect radio signals transmitted from one area on the surface of the earth back to another area on the surface at a distant location.
2. There may be a considerable number of layers in the ionosphere at any one time but they can be grouped together.
3. Scattered reflections. "An irregular type of reflection from the ionosphere occurs at all seasons and is prevalent both day and night. These reflections are most noticeable within the skip zone, or at frequencies higher than those nominally receivable from the regular layers. Like sporadic E, they occur at frequencies which may exceed the F2 critical frequencies, but are unlike sporadic E in that they are complex and jumpy causing signal distortion; they occur and disappear fitfully, and are almost useless for communications purposes. Some types are of very

weak intensity. The scattered reflections are characterized by very great virtual heights. Usually somewhere from 400 to 1500 kilometres. Their occurrence was thought for a time to indicate the existence of another layer above the F2 layer which might be called the G layer. It is now, however, thought that they are of several types, and that some of them are due to complex reflections from small, ephemeral, scattered patches or "clouds" of ionization in or between the normal ionosphere layers, and thence to one or more layers and ground by single or multiple reflection." This looked like a description of meteor scatter to me.

### Tunnels in the sky?

In 1940 the G layer theory was being replaced by a complex reflection theory. Today we describe these reflections as meteor scatter. The history of science can be considered as theories being replaced by subsequent theories once facts that do not fit the earlier theories are observed and accepted (Kuhn, 1970). I wondered if there was a way to modify the mirror reflection theory in some manner to explain the observations (9). Yes there was. It has been noted that VHF and UHF signals can be propagated for long distances via ducts that form between layers at different altitudes. The size and position of the ducts change and sometimes can be very localized such that if stations are only a few miles apart or even a few hundred meters apart, one can get signals into the duct and the other cannot. A hypothesis that seems to explain these observations of missing stations is that HF propagation through the ionosphere is via similar ducts or tunnels in the sky formed between the different sub-layers of a layer in the ionosphere rather than via a wide area mirror reflection. The ducts move around or change shape which is why propagation conditions vary (10). This article is not suggesting that the mechanism that forms a duct in the troposphere is the same

as the mechanism that forms the duct in the ionosphere; it is just postulating the existence of ducts in the ionosphere through which radio waves get propagated.

I also remember reading about some locations being better for working DX than others but can't locate the articles at this time. The ducting theory would postulate that some locations cannot access ducts that form in certain situations.

Back in Detroit in 1972, I was operating with a mobile whip from my balcony on the second floor (Kasser, 1974). By raising and lowering the end of the whip I could bring up the signal strength on some DX stations on 10 metres and 15 metres to the point where I could beat high powered locals in a DX pile up and come away with the contact. At the time the assumption was that changing the angle of elevation and optimising it for the particular path. Now I wonder if I was putting a better signal into an ionosphere duct.

### Testing time

The scientific method requires that others be able to replicate the observations. So,

1. Has anybody made similar observations?
2. Has anybody noted that they cannot copy stations being reported by locals (to them) on the PacketCluster or the DXCluster after making allowances for the differences between the receiving set ups?
3. Would more stations from Australia, New Zealand and other locations where the band occupancy is sparse start to spot DX and whether they can copy DX being reported by their locals (11).

In these early years of the 21st century, amateur radio has real-time links to various parts of the world via the Internet. As well as the DXClusters some radio amateurs have connected their stations to the Internet. This facility provides functionality that was previously unavailable. For example in the closing hours of the 2001 ARRL Sweepstakes I was at my desk

in Adelaide where it was Monday morning. I remembered about, and linked to the W4MQ station web site in Northern Virginia and made 15 contacts in the contest as W4/G3ZCZ (announcing they were via W4MQ remote) (12). I tried the link a few times later from home but was never able to work myself. With the current advent of DXClusters, Software Defined Radios and other web-interfaced radios it should be possible to set up some experiments to determine:

- (a) if the observations are repeatable under controlled conditions, and
- (b) collect data that might give us some idea of the size, shape and nature of the ducts.

It was observations by radio amateurs that opened up the high frequency bands for communications in the early days of the 20th century. If something hasn't been overlooked, then perhaps this study will show that we, radio amateurs, can still contribute to the theory of radio propagation in the 21st century. We have at least two major advantages over the professionals – (1) there are a lot more of us, and (2) we do not need to wait for research grants/funding to conceive and carry out experiments.

### Summary

Over the years I have noticed that when the HF bands were open all the stations that should have been operating from the DX locations were not being heard. The assumption was that this was due to a lack of activity in the DX location. However, recently, through the use of the DXCluster technology DX spots showing that stations that could not be heard were active from a DX area when at least one station from that area could be heard. According to the ionosphere mirror reflection theory they should have been audible, even if weakly. As a result this article has postulated that the ionosphere mirror theory needs to be modified to explain the observations of missing stations. I am requesting that if other stations have made similar observations, they report their observations. The hypothesis is

that radio waves in the ionosphere are propagated via ducts or tunnels in the sky in a similar manner to the propagation of UHF and VHF in the troposphere.

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### Notes

- 1: 40 metres to 10 metres.
- 2: In Europe and the US the problem is finding a clear frequency. In other parts of the world, the problem is reversed. The problem is finding someone to talk to.
- 3: I know, I have tried calling them. CW gets through much of time, but SSB is a lost cause under those circumstances.
- 4: And very frustrating it can be.
- 5: This difference between the signal levels produced by high-power transmitting stations being called by low-power DX stations is one reason for the many 'lack of ears' reports on the DX spots.
- 6: Don't be jealous, it's frustrating because they can't hear you.
- 7: Within a single skip zone and DX.
- 8: I teach my students that if they can, they should always check the original source
- 9: This is the scientific method. Make some observations, state a hypothesis, and look for data to support or refute the hypothesis. If experimental data refutes the hypothesis, think again and make a new hypothesis. In layman's terms – trial and error.
- 10: This situation can be seen in instances of sporadic E on 10

metres and 6 metres. I remember watching 50 MHz Band 1 TV from Jerusalem on summer Sundays in 1981 and 1982 with a simple fixed dipole. I was able to see stations from Eastern Europe slowly being replaced by others further westwards. The pattern was repeatable. In addition, late in the evening, after the local TV

station had signed off, I was often able to view the Harare TV station via transequatorial propagation mostly with multipath 'ghosts' that made the picture unviewable, but apparently did not affect the FM audio.

- 11: Free software can be provided.
- 12: I claim the first contest operation via an Internet remote site. The

time delays made the operation interesting. Earlier experience operating as W3/G3ZCZ, Silver Spring, MD allowed me to anticipate the exchanges and most of the contacts did not realize they were communicating with a virtual station.

## Silent Key

Dennis St Ruth VK2RM

Dennis VK2RM passed away in late 2011 after a short illness.

Dennis was a life member of the Blue Mountains Amateur Radio Club. He initially gained his Novice call, and then progressed very quickly to a full call.

Dennis moved to Alstonville after he retired and was soon on air. It was mandatory for any BMARC member to call in and enjoy a cuppa with Dennis and his lovely lady when they travelled north.

The call VK2RM was assumed by Dennis at the request of the widow of another Blue Mountains Amateur Radio Club member, Richard Meerstadt. He could be heard most days on one net or another, was part of the 'Northern Division' of BMARC, and our 'Net Manager'. His melodious tones, his welcoming voice and the friendship he showed to those who knew him, will be sadly missed. Vale Dennis St Ruth VK2RM.

Submitted by Daniel Clift VK2DC.



## ATN Antennas

wishes to advise that it is no longer manufacturing.

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# Strengthening the Foundations: How amateur radio enhances a marriage

Rananda Rich VK2FRAR, with technical support from Alex Taverner VK2RZ



Photo 1: This all makes a bit more sense to me.

A couple of years ago the opportunity came up to do my Foundation licence. My husband was sitting his Advanced theory examination on the same weekend, so together we would be able to go along to Waverly Amateur Radio Society where the training and testing was taking place. Normally I would not have considered doing such a thing. Like sailing, amateur radio is my husband's hobby. It's not like I would ask him to write a short story, let alone accompany me to a Pilates class.

However, communication and how and why we do it seems to be driving technology and modern culture forward very rapidly these days. Everyone seems to have a mobile phone; many have more than one, me included. Apparently we now surf the Internet more than we watch TV. Everything begins with 'E': e-mail, e-zines, e-business

etc... We listen to commercial radio all day long, in the car, through our earphones while we are exercising, while we work. Becoming involved in amateur radio seemed like an ideal opportunity for me to understand more about how we communicate. Maybe at the same time I could demystify my husband's contraption-filled study and the antenna-filled balcony...

The first day of the Foundation licence course was my first visit to the Waverly Amateur Radio Society shack at Rose Bay in Sydney. The timing of the course coincided with me coming to the end of an extremely busy period at work and the evening before had seen me have a few celebratory drinks after many months of long hours at the office. My husband had left *Your Entry Into Amateur Radio* lying around for a few weeks and once even found me flicking through it

briefly. He neglected to tell me that I should have read it from cover to cover but I was only to find this out later. I was totally unprepared.

My first impressions of the club were blurred because of another big difference between me and my husband. Timekeeping. I like to arrive early somewhere, check it out, and orientate myself to the surroundings. My husband, at best, likes to be 'on time', which in this instance meant that we arrived after the introductions of the course participants had commenced. I perched at the end of a table, hastily constructed a name badge, tried to read the names of the others in the room while listening to their reasons for doing the course. Residual fuzziness from the previous evening's drinks meant I could have done with a coffee.

It was only once we were into the first module about licences that I was able to fully take in my surroundings. We were sitting in a large scale version

of a typical bloke's shed. There were wires along all the walls and ceiling, bits of paper tacked to corkboards, tools all over the place, old comfortable sofas along the edges of the room and lots and lots of fluff on the floor. It looked like termites might also be co-habitants. There were lots of 'bits and bobs' all over the place. Some were in plastic trays, some on shelves, some fastened to display plates for educational purposes and some just plain lying around. Gradually over the two days, these things transformed into baluns, BNC plugs, coaxial lines, and other items that contribute to make functioning transceivers.

We learnt about electricity – it was like being back in a physics lesson at school as we worked our way through the technical basics. The course was more thorough than I expected. I had thought that communication protocol would be a bigger part of what we would cover, but actually, practicing aside, this was relatively straightforward and I appreciated learning the rules and guidelines within which we operate. Later, I mentioned to my husband that I was worried about getting into a conversation over the radio and not being able to close it out. I'm not a great conversation starter or finisher and I could foresee myself trapped in

an endless rambling discussion. He explained that in practice this is not the case. There is an etiquette that is well developed and well used.

A large part of the course was about antenna building, testing, and, overriding everything else, safety. The number and opportunities to try different things are limitless and all of a sudden I started to recognise how a retractable metal measuring tape might be used to construct a portable antenna (the use of a slinky still eludes me to this day).

By mid-morning my enthusiasm had been wetted thanks to the natural and boundless enthusiasm of our teachers. I would have appreciated it if my husband had explained that I needed to bring a passport photo along though, as I had to spend my lunch break in Rose Bay shops seeking out someone to take a post-hangover photo of my pallid demeanour that is now permanently affixed to my certificate of proficiency.

I am glad that I got up very early on Sunday morning to go over what we had covered the day before. Throughout the two days I was thinking of the multiple choice exam looming at the end along with the practical exam and, indeed, the biggest hurdle of the whole experience was the practical exam. My husband

had explained that this was just a ten minute hands on exercise, so, as one of the last to be called in, I wondered why it was taking the other course participants so long. Little did I know, until I went in for my test, that this was no mere practical but an oral exam of the entire syllabus! I am pleased to say that I passed but boy did my husband cop an earful on the way home about 'setting expectations'. He had an excuse – the examination process had changed since he did it a few years ago...Huh.

I am very proud of my certificate and of receiving my licence. I am pleased that I know how not to get electrocuted when converting electricity into radio waves and vice versa. I can discuss what's for dinner over the transceiver in the car on my way home – and I do not mind who listens in. I now have half an idea about what is going on in my husband's study.

It is said that the key to any strong relationship is communication. So this takes on a double meaning in our marriage now. Not only can we literally communicate with each other in a new and interesting way but I understand and share another common interest with my husband and the foundations of our marriage have been further reinforced.



## VK5news

Christine Taylor VK5CTY

## Adelaide Hills Amateur Radio Society (AHARS)



As usual the holiday months are mostly devoted to social activities but AHARS is certainly looking forward to the new venue for their meetings.

The club picnic in January was attended by over 70 people and although it was a hot day, the breeze and the company made it a very pleasant day.

During the Australia Day weekend the Club's assets were moved from the Belair Community Centre to the Blackwood Senior Citizens' Centre ready for the first meeting there on the

third Thursday in February, the 16th, starting at 7.30. All are welcome.

This will be the AGM and after supper we will have a short talk by Steve VK5AIM on the 'History of Vacuum Tubes (Valves)'. There will be a display of some of the different types of valves which should be of particular interest to the younger members, some of whom have possibly never used or seen valves. For the older members there will likely be many conversations that start with, 'I used one of those when I made my ...' or 'I remember a set I had some years ago that used those valves'.

The Shack will continue to be open on the second and fourth Saturday mornings for some socialising and on each of the fifth Saturdays for a club breakfast. The first breakfast will be in March.

The usual luncheons at the Blackwood RSL will be held on the second and fourth Fridays, members and partners are welcome.

The only official photographs taken at the picnic were of Christine VK5CTY sharing some of the single malt whiskey she had won at the Christmas dinner!



# A one metre diameter magnetic loop for 14 MHz

Jim Tregellas VK5JST

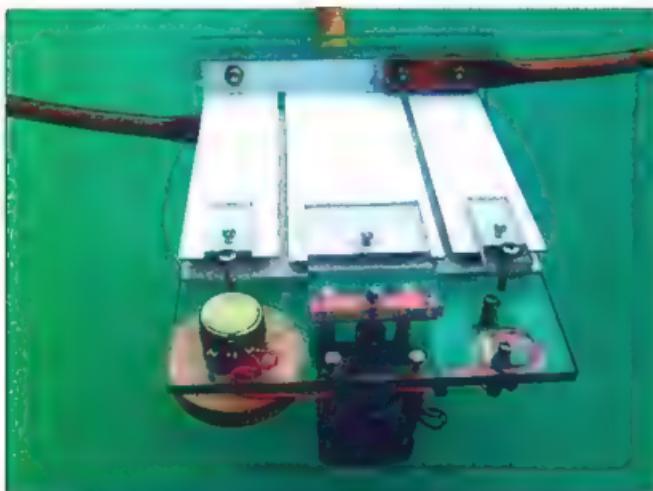


Photo 1a: The capacitor and stepper motor assembly.



Photo 1b: The capacitor and stepper motor assembly.

Here is another design for a magnetic loop, and this time it is a 0.16 wavelength unit for the 20 metre band. Carefully built, it offers an efficiency of around 50% and will equal or better the performance of a half wave dipole. It will do this at a height above ground of three metres or more and in common with all loops has a very low radiation angle making it great for DX. This loop can be remotely tuned, and continuously operated at 100 watt power levels. It is intended to be installed out of the weather and out of sight under a non metallic roof and makes the perfect stealth antenna.

## The theory

Reference should be made to my previous article (Reference 1), in which the theory behind the design of a magnetic loop and the selection of materials is covered in near exhaustive detail. This loop uses an identical approach, and also uses

the same controller circuitry and so there is no point in repeating this information.

The only significant differences between the two designs lie in the way the ultra low loss tuning capacitor is built and in the fact that 12.7 mm (half inch) copper water pipe is used for the main loop conductor.

Dealing with this last point first, at 14 MHz and above it is absolutely vital that the main loop conductor has a very smooth surface. The depth of the 'skin' in which the RF current flows on the outside of a conductor decreases rapidly as the frequency rises, and so it is simply not possible to use rough materials like the outer sheath of ordinary coaxial cable (e.g. RG8 and RG213) without incurring losses which are totally unacceptable. Because skin effect forces the current to remain on the very outside surface of a conductor, these large losses result

from the RF current having to hop from one strand to another in the sheath, as each strand disappears under another in the weaving. The result is a huge drop in the operating Q of the loop and a similarly huge drop in radiation efficiency. Of course, the outer sheaths of expensive and flexible coaxial cables such as LDF4-50 and LDF5-50 are still good propositions, but from a cost point of view are not as attractive as ordinary copper water pipe, which was used in this design. Despite the recent large increases in the price of copper, the 3200 mm length of water pipe used still results in a cheap antenna.

The design of the variable capacitor is novel, and relies on the fact that the operating frequency of the antenna only needs to be tuned from 14.0 - 14.35 MHz. This is a 2.5% frequency change, or just a 5% capacitance change, and so a simple, very low loss and high

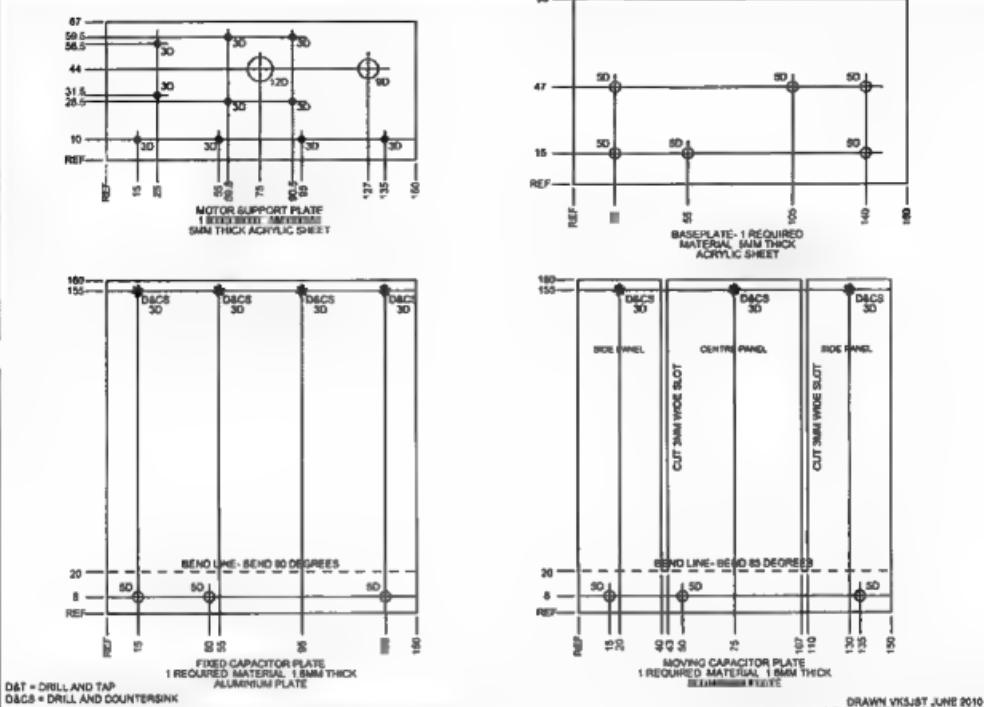


Figure 1: The technical drawing for the various aluminium and acrylic plates used in the magnetic loop antenna.

current tuning capacitor can be designed by arranging to move its two plates slightly apart to vary the capacitance.

In fact, in this design, one of the two capacitor plates is split into three sections, and it is only the central section of this plate which is moved in and out under the control of a stepper motor to vary the operating frequency. The outer two sections of this plate are adjusted during the setting up process for the antenna but thereafter remain fixed in value.

The inter-plate spacing has been chosen as 5 millimetres minimum, meaning that the capacitor structure will happily cope with peak voltages of 15 kV, or RMS voltages of 10.5 kV. This is considerably in excess of the requirements for operation of the antenna at 100 watt power levels, but it is nice to have some margin up your sleeve for the inevitable day when some six or eight legged

Australian beastie crawls into the capacitor air gap.

### Building the antenna

To make construction easy, one needs access to a good circular saw, a bench drill, and a flycutter. And of course the usual marking out tools, including a good square, a sharp scriber, and a centre punch. All of the parts detailed in the drawings should be carefully made up. A little cunning is in order, and the capacitor plates should be made first. These can then be used to check your marking out on items such as the acrylic bottom spacers and base plate, and the plate on which the stepper motor and 1 kΩ linear feedback potentiometer are mounted. Note that the flange on the fixed capacitor plate should be bent at 90 degrees, while the flange on the moving plate should be bent at 85 degrees. This ensures that due to

the tension of bending, the stepper motor will always determine the position of the central section of this plate. Note that provision has been made on the motor plate to mount a DB9 connector on 12 mm long spacers. All motor and potentiometer connections should be terminated on this connector.

When assembling the capacitor plates and spacers to the base plate, space the bottom of the two capacitor plates exactly 5 mm apart using a temporary spacer.

Do not omit the spacers between the flanges of the capacitor plates and the base plate. During initial testing, a rapid drift in SWR was observed during long overs. This was traced to heat build up in the acrylic base plate, caused by its immersion in the intense electric field existing between the lower edges of the two capacitor plates. This heating caused a change in capacitance which

detuned the antenna and raised the SWR. Adding the two spacers totally fixed this problem. Note that the operating Q of this antenna is around 850, giving a 3 dB bandwidth of about 16 kHz. This figure is really only relevant to receiving mode, because under transmit conditions, the antenna tuning only needs to vary about 3 kHz to seriously upset the SWR and so the temperature coefficients in the loop need careful control.

To form the main loop, the 3200 mm length of 12.7 mm (half inch) copper water pipe should be bent into a circle using a temporary jig. I used an old bicycle rim to which I firmly taped one end of the copper pipe. I then rolled the rim along the ground to form a slightly small but perfect circle of tube. This was opened out by hand to the 1 metre diameter required, and I then

flattened both ends of the tube in a bench vice over a distance of 65 mm. These flattened areas were then drilled with holes 35 mm apart to match the holes in the flanges of the capacitor plates.

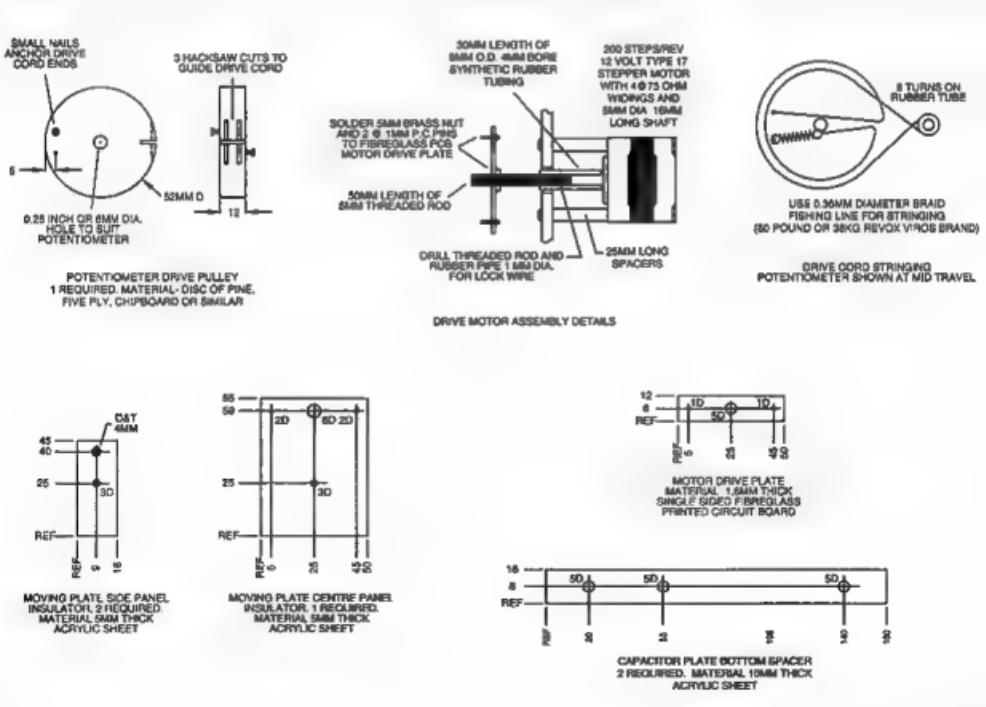
Note how drive from the stepper motor drive screw is transferred to the centre section of the moving capacitor plate. The piece of synthetic rubber tubing acts as a simple universal joint and the piece of printed circuit board with its two drive pins accommodates the bending of the capacitor plate as it moves back and forth.

Stringing the drive from the stepper motor may try your patience but it is worth persisting. Note the eight turns around the motor shaft. This, together with a piece of wire which passes through the rubber tube and drive screw ensures that there will be absolutely no slippage in

the potentiometer drive mechanism. Start your stringing on the nail on the potentiometer pulley closest to the motor support plate, which will allow you to finish your stringing (with tensioning spring) on a nail you can easily get to on the other side of the potentiometer pulley. Follow the diagrams closely. When you have finished, set your potentiometer to mid travel with the drive pulley in the position shown in the diagram and then lock the wooden pulley onto the potentiometer shaft with a dob of Araldite or similar. Alternatively, a small self tapping screw can be screwed into the gap between the flat on the potentiometer shaft and the pulley.

Make up the circular coupling loop from a 640 mm length of copper wire of around 2.5 mm diameter (or copper gas or hydraulic tube). As shown in the photos, position this

**Figure 2: Technical drawings showing the drive motor assembly details, and capacitor and motor drive plate construction details.**



at the bottom of the main loop at the current maximum opposite the tuning capacitor.

Finally, fabricate the control electronics as detailed in the previous article for the 80 metre loop in *Amateur Radio* magazine (Reference 1) and make up all interconnecting cabling.

### Setting up

At the top of the capacitor, adjust the gap between the fixed plate and the central section of the moving plate to exactly 5 mm. This can be easily done by pulling the central section of the moving plate backwards, allowing the stepper motor drive plate to be spun up and down the drive screw. The potentiometer should be at one end of its travel when you do this. Using the adjusting screws provided on the top of the two outer sections of the

moving plates, adjust the antenna to resonance at 13.95 MHz. Try to equalise the two air gaps when doing this and keep your body well away from the loop to eliminate the effects of stray capacitance. The very high Q resonance will be difficult to find and you will need to tune your antenna analyser very carefully indeed. Alternatively you can look for the noise peak on a general coverage receiver.

Next, use the potentiometer and its motor drive to move the central section of the moving plate outwards and check that the antenna resonates beyond 14.35 MHz. The stepper motor will move through approximately five turns. If the SWR is not quite optimum, it can be adjusted by stretching or flattening the coupling loop, and/or by slightly overlapping the main and driver loop conductors.

To ensure that the cabling to the stepper motor and feedback potentiometer has no effect on the loop resonant frequency, run it horizontally away from the motor for about 600 mm and then drop it vertically. I used some shielded six core computer cable I happened to have which is readily available (Altronics W2710, Jaycar WB-1875). Because the motor windings are 75 ohms and only draw around 120 millamps each, very long runs (50 metres) of control cable will have no effect on operation of the system.

Good DXing.

### References

1. Building an 80 metre magnetic loop for your attic, Jim Tregellas VK5JST, *Amateur Radio*, July & August, 2011.

# Silent Key

Don Graham VK6HK

VK6HK Don built and operated amateur radio station VK6HK after gaining his licence in 1951. Apart from his HF activities he was renowned for operation on 50 MHz as well as VHF, UHF and microwaves to 10 GHz. The development of the adjacent property with 2 two storey houses cramped his 6 and 2 metre activities in his final years. However he was one of the few Perth amateurs to work into South Australia and Victoria on 144 and 432 MHz. Don died on 13 January 2012.

Don was a Foundation Member, President for a number of years, Life member and Trustee of the WA VHF Group. He was the engineering genius behind the Group's state-wide beacon network. The first beacon was established to help research on the propagation of radio waves in the International Geophysical Year 1957. At the time of his death he was working with Andrew Martin VK3OE and Phil Harman VK6APH and others in the development of a software controlled digital identification

system, a chirp radar that has world-wide significance.

He was also a founder of the Perth Amateur Television Group, constructing the ATV repeater located on the Darling Scarp (since de-commissioned).

Apart from these, Don was a member of the WIA, a contributor to *Amateur Radio* magazine, a member of the WA Repeater Group and resurrected radio equipment for the Air Force Museum at Bull Creek.

Following National Service in the RAAF as a Wireless Maintenance Mechanic, his first job was at the Department of Civil Aviation (DCA). In 1960 he decided to further his education by starting a communications engineering degree at the Western Australian Institute of Technology (now Curtin University). By then juggling full time work at the PMG Department, and a young family, alongside his studies, it must have taken a lot of determination - and he successfully graduated in 1967.

He joined the Australian Broadcasting Control Board in 1970 as the Assistant

State Broadcasting Engineer, working on technical regulation and site planning later becoming the WA State Broadcasting Engineer for the Department of Transport and Communications for many years prior to retirement. He was regarded by the broadcasting industry as a fine engineer with an excellent understanding of broadcasting equipment, communications systems and radiofrequency propagation.

Don has left a lasting legacy and he has one final message for us amateurs. He showed his appreciation for the love and support of his wife Patricia by culling his "junk", indicating the likely sale value of his equipment and leaving advice on how to dismantle his tower. We should do similarly for our loved ones.

Wally Howse VK5KZ

# DX-News & Views

John Bazley VK4OQ  
e john.bazley@bigpond.com

Well, what a start to 2012, with DX 'aplenty'. At the time of writing, there is activity from HK0/M, VP6, TN2, C21 and T32 – not forgetting Trevor VK0TH on VK0/M.

Trevor VK0TH, in an endeavour to give out as many QSOs as possible before leaving Macquarie Island in April, has really suffered terrific QRM from stations continually calling on his frequency. He is now limiting his activity from 0700 to 1200 UTC. He has relocated the multi-band vertical to the 'top of Ham Shack Hill' and also put up a broadband dipole. In the last few weeks he has worked some 2,500 QSOs on the vertical and his total number of QSOs is over 8,000. Trevor is active on SSB, CW, PSK, RTTY and Hell. Kevin VK0KEV is now back in Australia having completed his tour of duty. All QSLs for both Kevin and Trevor are via JE1LET.

Another DXpedition has just been announced to 3C, Equatorial Guinea, and 3C0, Annobon Island, set for February–March. Departure from Spain is scheduled for February 21 but a departure on February 14 is still a possibility. 3C6A will be from Bioko Island, Equatorial Guinea, and 3C0E will be from Annobon Island. Consecutive operations apparently!

The two operators will be Elmo EA5BYP and Javler EA5KM. They will be equipped with a pair of Yaesu



Photo 3: The VP6T gang, with host Betty VP6YL, from L-R: Nigel G3TXF, Betty VP6YL, Vincent F4BKV, Jacques F5BEE and Michel FM5CD, on Pitcairn Island.

rigs and an Icom to a Spiderbeam and Hexbeam, each for five bands, with kilowatt amplifiers. For 160-30 they will have verticals. They hope to meet the demand for contacts on 160 metres and will announce a day ahead a special night of 160 metres. The emphasis here is waiting for a night of promising propagation, with low noise. Also available will be at least one Beverage receiving antenna and a five element Yagi for six metres. The operation will be expensive and the operators welcome financial support. QSL direct with self-addressed envelope and enough postage to cover the

have a few stations on the air simultaneously from Tonga during the period 7 to 24 March, with the call A35YZ, with operations on 160–m CW and SSB, plus one station dedicated to digital modes and SSTV. <http://d17df.com/a35yz/>

Gerard F2JD will be departing for Copan, Honduras on February 2. Listen for HR5/F2JD to be QRV on all bands and modes until May 6. He will have an online log at <http://lesnouvellesdx.fr/voilogs.php> QSL via F8AJA.

3D2YA from Fiji will be active from 15 to 21 March, with Yoshida JA1NLX operating. He plans to be on Yageta Island, OC-156, on 80-10 m CW, with

Photo 2: Trevor VK0TH out and about on Macquarie Island, with a few of the locals in the background.



Photo 1: Trevor VK0TH in his Macquarie Island shack.



return QSL. That should be two US dollars or two IRCs or, within Europe, one US dollar or one IRC. The log will be put on LoTW a few months later, QSL via EA5BYP. The website can be found at <http://www.gdgdx.net/3c0ef/>

Sigi DL7DF and nine experienced operators will

possibly some RTTY and SSB. QSL via JA1NLX. Every QSO will get a bureau card and the log will be put on LoTW when he is back in Japan. <http://ja1nlx-aki.blogspot.com>

John AD8J will be a scuba tour guide first and operate amateur radio second from Little Cayman, **Cayman Islands** from 1 to 10 March. He will be using an IC-746PRO and signing ZF2AG/ZF8 on 20-10 m CW and SSB. QSL via AD8J either direct, via the bureau or LoTW.

The 10-15 March TX5Q operation from **Clipperton Island** has been cancelled 'due to unforeseen problems with logistics and costs. We will plan to carry out a major DXpedition to Clipperton in early 2013. If you are interested in the project, please contact KK6EK at [cordell.org/](http://cordell.org/)'.

Plans for a DXpedition to **Layang Layang, Spratty Islands** are developing. A large team of operators from Malaysia, Japan and England, divided up into three groups, is expected to be active as 9M0L indicatively between 5 and 17 April. A website is under construction at <http://9m0l.legendchew.com/>

'The 3D20CR crew is on tour again!' E51M is the callsign for their Manihiki, **North Cooks**, operation from 28 March to 10 April. Operators will be DJ8NK, DJ9HX, DJ9KH, DK9KX, DL6JGN, PA3EWP and SP3DOI, on 160-6 m CW, SSB and RTTY. The flights are booked and paid for and all the equipment except transceivers is already prepositioned on Manihiki. There will be 11 vertical antennas and a four element beam for six metres. The table top gear will be Elecraft K3s with 500 watt amps. The log will be on LoTW 'in due time'. There will be no internet connection on the island, so there will not be an online log. They have a web page: <http://manihiki2012.de/> To offer financial support, contact them at <http://manihiki2012.de/help.html>

QSL direct or bureau to DJ8NK, Jan B.B. Harders, Kalckreuthweg 17, 22607 Hamburg, Germany. Online QSL requests for bureau and direct cards can be made after 20 April at <http://manihiki2012.de/OQRS.html>

V21FS is the **Antigua** callsign for Babs DL7AFS, while Lot DJ7ZG

has the callsign V21ZG for their operation that starts 5 March. They will be there for 'a few weeks'. They say they will focus on 15-6 m and will make a special effort to look for Japanese and QRP stations. Their QTH is the Villa Sundowners near the Pottery Village. QSL to DL7AFS or via the DARC QSL bureau. [www.qsl.net/dl7afs/](http://www.qsl.net/dl7afs/)

SH3MB in **Tanzania** will be active from 4 March to 4 April. Maurizio IK2GZU will operate, while he is there, at the 'Mission Ilembula' doing work at the new hospital and orphanage. He will do some HF operating with his own FT-100 rig and the TS-850 that belongs to the mission. There is a tribander fixed on Europe and a vertical and dipole. The mission is 800 kilometres south of Dar es Salaam. He will put the log on LoTW when he is back home. QSL via IK2GZU.

Susan W7KFI has postponed her planned KH3 Johnston Atoll. The US Fish & Wildlife Service, that controls the island, is requiring that she pull her boat out of the water and scrape and repaint the hull. The boatyard was not available to do the work immediately. Departure from Hawaii will be sometime in February 'at the earliest'.

Randy N0TG and Jeff N1SNB plan to be QRV from the **US Virgin Islands** as NP2/N0TG and NP2/N1SNB from March 7 to 14. QSL both via N0TG.

Take JG8NQJ returned to **Minami Torishima Island** during January where he will stay for three months working at the weather station. Plans are to begin operating on the air about a week later, after he builds and installs his antennas. 'He will operate mainly CW and some SSB, no RTTY this time' says Toshi JA1ELY. In order not to interfere with the weather station equipment he will not be able to run high power, therefore he will be running 50 watts. A three element Yagi will be used on 20, 15 and 10 metres and dipoles for all other bands, except 80 and 160, where there is presumed to be no activity. While on the island there can be no personal use of the Internet, so Take will be mailing his log monthly

to his QSL manager JA8CJY. Direct cards only go to: Susumu Sanada: 5-17, 5 Jyo-4 Chome, Shinsei, Kiyota, Sapporo, JAPAN 004-0835. Bureau requests should go via JG8NQJ, not JA8CJY.

Dave VO1AU has just finalized his 'travel arrangements' to the Henga Lodge on **Chatham Island** (ZL7). Plans are to be there from March 8 to 13, including the BERU contest.

Sergiy UV5EVJ (ex 5X1VJ) has announced plans to be working with the UN at the Monusco mission from the Katanga province in the **Democratic Republic of Congo** (9Q) starting March 12 through May 9. Plans are to be QRV on 3.5 through 28 MHz on CW and SSB in his spare time. His callsign is yet to be announced. QSL via UV5EVJ either direct or via the Ukrainian QSL Bureau.

QSL 3B8FA - Patrice 'Pat' Mompie 3B8FA has been inactive for a long time and is now QRV again from Mauritius. He has chosen Buzz NI5DX, as his QSL manager. He will be able to confirm only contacts made with 3B8FA from 23 January 2012 onward. Buzz will be designing a card and having it printed; it will take about five weeks for him to receive the cards from the printer.

R1MV - **Malyj Vyotskij**. This 'country' will no doubt become 'DELETED' sometime in mid-February. It became a 'new country' in 1988 and saw several DXpeditions over twenty years or so. The 'lease' by Finland, from Russia, was due to expire in 2013. After re-negotiation and all the diplomatic things were completed, the necessary documents were signed and exchanged January 17. The new agreement was to take effect one month later, on February 17.

Good luck in the pile-ups until next month.

Special thanks to the authors of *The Daily DX (W3UR)*, 425 DX News (#1JQJ), QRZ.DX and JE1LET for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two-week trial of *The Daily DX* from [www.dailyydx.com/trial.htm](http://www.dailyydx.com/trial.htm)



# VHF/UHF - An Expanding World

David Smith VK3HZ  
e: vk3hz@wia.org.au

## Weak Signal

After the spectacular end to the year, January began with a bang but then ran out of steam as conditions rapidly fell away. However, before we get to the New Year, I received a number of reports from people about the final day of 2011 that are worthy of inclusion.

Kevin VK4UH, west of Brisbane, reports that after being alerted by a phone call from Colin VK5DK, he briefly(!) left a houseful of guests and the preparations for a New Year's celebration and worked VK5DK, VK3HY, VK3KH, VK3HZ, VK3BDL, VK3BBB, VK3OER, VK3LY, VK3BJM, VK3EJ, VK5NY, VK5PJ, VK3AMZ, VK5AKK, VK5JG, VK5ZK, VK5NZ, VK3MIR and VK5CP/p.

Ron VK4BRG near Bundaberg reports: *I worked stations from 0158 to 0514 UTC - a duration of 3 hours 16 minutes, which is far in excess of anything I have previously experienced. Stations worked included FK8IA on both SSB and FM, 1 each VK1 and VK7, 3 x VK2, 15 x VK3 and 5 x VK5. The opening was even more remarkable as far as I was concerned as I was running 100 W to just a 5/8 vertical, 3.5 m high on my garage roof!*

From Colin VK5DK: *My first contact was with VK4KR at 0220Z. In all I managed to work 21 VK4 and four northern VK2 stations. They were in order of contacts VK4KR, VK4JF, VK4ACE, VK4OX, VK2XW, VK4IBR, VK4ZAA, VK4KKY, VK2XN, VK4VDX, VK4MJF, VK2FZR, VK4ARN, VK4QSY, VK2PB, VK4ADC, VK4KSY, VK4NWH, VK4NE, VK4UH, VK4CDI, VK4HJ, VK4FPFH, VK4BRG and VK4BLK.*

To complete the evening I was able to work Joe VK7JG, Winston VK7EM in northern Tasmania, Nick VK3VFO in Morwell, Ross VK3MY in

Melbourne and, after over 48 years of trying, I was able to work Bob ZL3TY at 1055Z on Tropo. Bob was on CW (5/2/9) and I was on SSB with 5/2 reports exchanged.

So, on to 2012.

Following on from the previous column, New Year's Day had Bob ZL3TY busy working stations up and down the east coast via tropo – as far west as Andrew VK3OE in Melbourne.

On January 2nd, good conditions across to ZL continued with Nick ZL1IU, Steve ZL1TPH/P and Bob ZL3TY working across to VK2 and VK4 stations on both 2 m and 70 cm.

The 3rd of January brought the most spectacular day of propagation that has been experienced in many a year – many say it was THE best. From about 2300Z to 0330Z, an Es cloud over the Tasman Sea produced a huge opening on 2 m across to New Zealand. The opening covered all of NZ and extended west to Adelaide and beyond. Stations from VK1, 2, 3, 4, 5 and 7 on one side worked ZL1, 2, 3 and 4. A plot of the contacts logged on the VK Logger is shown on Figure 1.

At times signals were so strong that stations in Melbourne with only a dipole or a vertical whip were easily able to work into ZL. There were so many stations on that 2 m was, at times, like 20 m on a busy day.

Brian VK5BC, who was portable



Figure 1: Two metre contacts on 3rd January 2012 from 2200Z to 0400Z.

at Corny Point on the southern end of the Yorke Peninsula, worked what could be termed a quadrangle of stations - ZL1TPH/p, ZL2WHO, ZL3TY and ZL4PLM. At 0107Z, he also worked Dave ZL2OK on the far side of the north island for possibly the longest distance for the day – 3493 km – and a new VK5 distance record.

Colin VK5DK in Mt Gambier was also having a busy time. He writes: *I was working some very unusual propagation on 50 MHz with very strong backscatter signals into the Melbourne area, all the while checking on 144 MHz. At 2350Z, I heard and worked ZL1TPH/p, which was the beginning of a three hour Es opening to ZL from this QTH. The following ZL stations were worked in order of contacts: ZL1TPH/p again worked at 0001Z at 5x9 then ZL1TBG 5x9, ZL2WHO 5x5, ZL3TY 5x9, ZL3AAU 5x5, ZL3NW 5x7, ZL3ADT 5x7, ZL4PLM 5x5 and concluded with ZL3MH 5x5 at 0307Z.*

Tony VK5ZAI reports that his best contact on 2 metres was 3122 km with Mark ZL2WHO in Palmerston with 5x7 reports both ways. Other 2

metre contacts were with Bob ZL3TY and Ross ZL3ADT.

Steve ZL1TPH spent four days portable at Cape Reinga (RF65) at the top of New Zealand. He had two days of 2 metre Es and three days of tropo. During that time, he logged 86 contacts to 46 different stations. Highlights were working VK5BC/p, VK5NY and VK5DK on Es, the many VK3 stations on Es and also five stations worked on 432 MHz from VK2.

Ron VK3AFW reports: Having missed out on the big VK4/2 to VK3/5/7 Es on 2 metres in late December, I was pleased to have a compensation prize this morning (3 Jan), six countries on 6 metres and then six ZLs on 2 metres with as many heard but not completed with. I also worked VK5s from Mt Gambier to Corny Point at good strength on backscatter on 6 metres.

ZL3TY for 10 minutes was showing all green and two red LEDs on my guess meter, others giving similar reports. He qualifies as the loudest ZL heard in Melbourne. He must have worked 30 VK3s during the best hour. Some operators I had presumed were deceased showed up. A couple of VK3s used simple vertical whips to work into ZL.

Most stations came up out of the noise for a short time before sliding back, repeating this several times during the opening. The footprint moved around with stations only a few km apart having quite different signals. All typical Es.

Not to be outdone the VK7s and VK5s managed a number of 2 metre ZL contacts. Of course, the coastal VK2s and VK4s had some tropo with perhaps some Es.

Needless to say, January 3rd 2012 will be talked about for many years. The rest of January, however, is another matter. Conditions dropped back to 'normal' with only a few brief Es openings between VK1/2/5 and VK4 on January 8th, 10th and 11th.

Across the Bight, the VK6REP beacon was being heard regularly in Adelaide, but no contacts were being made.

On the morning of January 19th, Norm VK7AC managed to work into

Adelaide (1010 km) on 70 cm having contacts with VK5ZK, VK5AKK, VK5TH and VK5ACY.

January 25th brought more good conditions across the Bight – this time with a number of contacts. At 2145Z, Jim VK3II worked Ron VK6VOX (2560 km). That afternoon, Wally VK6WG made an appearance working Colin VK5DK, Chas VK3PY, Graeme VK3GL and several Adelaide stations on 2 metres. On 70 cm, he also worked Colin and Brian VK5BC. Bob VK6BE was also on air working Ian VK3AXH and a number of Adelaide stations.

Colin VK5DK again reports: I heard a signal on 144.100 with the antennas bearing east. It turned out to be Wally VK6WG calling from Albany in WA (2071 km). We were able to complete a good QSO with signals peaking to S9 both ways. A contact on 70 cm was completed at 0629Z with signals from Wally at S9+20 db. An attempt on 23 cm was made, but although Wally received my signals quite well he was having trouble transmitting on 23 cm, so no two-way contact was made. The VK6REP Esperance beacon on 144.5665 MHz had been peaking to S7 at my QTH.

It is a pity that there is no beacon operational at the present in Albany – both the 2 metre and 70 cm beacons are off air, reasons unknown at this stage.

And so January came to a close with only a whimper compared to the spectacular opening on the 3rd.

### Vale Don Graham VK6HK

Sad news during the month was that VHF/UHF legend Don Graham VK6HK passed away on January 13th. Wally VK6KZ writes: Don was one of the major drivers of the West Australian VHF Group state-wide system of VHF/UHF and microwave beacons. His understanding of

the bureaucratic requirements for licenses together with engineering knowledge and skills were among his key contributions.

Much of his station was constructed by him and his operating techniques were a model for others to copy. His current activities were in the digital world helping Andrew Martin VK3OE and Phil Harman VK6APH develop hardware and software for a world leading chirp radar beacon.

He will be sorely missed!

Please send any Weak Signal reports to David VK3HZ at [vk3hz@wla.org.au](mailto:vk3hz@wla.org.au)

## Digital DX Modes

Rex Moncur  
VK7MO



### 10 GHz Grid Square Tour

During January, 2012 Rex VK7MO activated some rare grid squares on 10 GHz as set out in Table 1.

QF57 was activated from Bald Mountain on the property of Tom Burt VK2TB – thanks to Tom for providing such a great location. See Photo 1.

Photo 1: Operations from QF57 Bald Mountain near Mudgee, NSW. Tom Burt VK2BT features in the photo.





Photo 2: Operations from PF86 near Cleve, South Australia, with Jim Walford in the photo.

The location at PF86, near Cleve SA, was identified by Jim VK5JW who also participated. See Photo 2.

It was noted that the troposcatter contact with VK5DK from PF85 was spread around 60 Hz (typical of long distance troposcatter on 10 GHz) whereas the tropoducting contacts from PF75 with VK5DK and VK3HZ showed no spreading. This feature of tropoducting should provide a useful advantage when using narrow bandwidth modes such as JT65. It is also noted that aircraft scatter causes no significant spreading giving it an advantage over troposcatter with narrow bandwidth modes. These features of tropoducting and aircraft scatter suggest that such modes will have even greater benefits at

24 GHz and higher frequencies. An issue with aircraft scatter is the Doppler shift, with JT65 requiring the aircraft to cross at no more than 10 to 15 degrees whereas the wider bandwidth mode ISCAT-A allows the aircraft to cross at right angles – but has about 8 dB less sensitivity.

The digital contacts from PF86 and PF75 to VK3HZ resulted in new national digital records at 832 km and 843 km and the SSB contact from PF75 to VK3HZ a new VK3 record. There is some evidence that the longer distance aircraft scatter contacts are assisted by improved tropoducting conditions as indicated on the Hepburn charts and if this proves to be repeatable offers the prospect of making longer aircraft scatter contacts.

(Rex did manage to attract quite a deal of interest during his operations at Port Lincoln. One person filming a time-lapse of the dawn view from the lookout was intrigued enough to film an impromptu interview that was immediately uploaded to YouTube: <http://www.youtube.com/watch?v=tHUB85RHURGs>

The local press also interviewed Rex:

<http://www.portlincolntimes.com.au/news/local/news/general/record-set-at-winter-hill/2430604.aspx>

All very good publicity for our hobby. Please send any Digital DX Modes reports to Rex VK7MO at [rmoncur@bigpond.net.au](mailto:rmoncur@bigpond.net.au)

## The Magic Band – 6 m DX

Brian Cleland VK5BC

As reported in last month's notes, the first few days of January were very exciting on 6 metres with a great opening to W5 on 1st January followed by openings to central America, XE, TI5, HP3 and OA4 on the 2nd and 3rd. Roger VK2ZRH has produced a great analysis of these openings as follows:

### Spectacular Trans-Pacific 6 metre event 2-3 January, 2012

Six metre propagation put on a spectacular performance over the first couple of days of the New Year for six metre operators on either side of the Pacific, in both northern and southern hemispheres.

Grid	Location	Station	Station's Location	Mode	Propagation	Distance	Rpt Sent & RXed
QF57	Bald Mt NSW	VK3HZ	Near High Camp Vic	ISCAT-A JT65c	Aircraft Aircraft	715 km 715 km	-12, -20 -17, -20
QF29	Tilpa NSW	VK3HZ	Mt Macedon Vic	ISCAT-A	Aircraft	721 km	-20, -11
PF84	Tourbridge Hill SA	VK3HZ	Balwyn Vic	JT65c	Aircraft	728 km	-17, -19
PF85	Near Yorketown SA	VK5DK	Mt Gambier	JT65c	Tropo-Scatter	446 km	-17, -14
PF85	Near Ardrossan SA	VK3HZ	Mt Macedon	JT65c	Aircraft	699 km	-25, -17
QF53	Narooma NSW	VK3HZ	Near High Camp Vic	JT65c SSB	Aircraft Aircraft	482 km 482 km	-15, -13 5/1, 4/1
PF86	Near Cleve SA	VK3HZ	Mt Macedon	JT65c	Aircraft	832 km	-19, -25
PF75	Port Lincoln SA	VK5DK	Mt Gambier	JT65c	Tropo-duct	568 km	-19, -15
PF75	Port Lincoln SA	VK3HZ	Mt Macedon	JT65c SSB	Tropo-duct Tropo-duct	843 km 843 km	2/1, 3/1 -14, -15

Table 1. QSOs on 10 GHz, January 2012, grid square tour.



Figure 2: A spectacular day on six metres!

The snapshot map in Figure 2 above, created from VKLogger spots by Adam VK4GHZ, gives an overview. Intense Es openings around Australasia over 2–3 January UTC bloomed into transequatorial propagation to north and central America, and a surprise – long-range Es between Peru and VK/ZL.

As reported in the Jan/Feb issue of *Amateur Radio*, on New Year's day (VK time), 6 metres was open to FK8 from 0005 UTC, a foretaste of what was to come. From 0020, stations in EM00 Texas – W3XO/5, W5QZI and N5TSP – worked VK2, VK3, VK5 and VK7; K5RK in EL29 joined in and the XE2HWB/B beacon was heard in VK5. The opening lasted nearly two hours.

But the next day (2nd and 3rd UTC) was even better. Six metres opened from 0000 UTC to Costa Rica and Panama. TI5XP (EK70NM) worked into VK2, VK4 and VK5. TI7/N5BEK (EK70CK) worked into VK4, VK5 and VK7, followed by TI2KI/8 (EJ79) into VK2. HP3TA in Panama (EJ88) worked into VK3 and VK5. XE2HWB worked into VK2 and VK3. In the midst of the action, the previous day's US stations in EM00 worked into VK2, VK3, VK5 and VK7, picking up ZL contacts along the way. All these contacts, and those the day before, were clearly Es-extended, skewed-path transequatorial propagation (TEP).

support chordal hop (TEP) across the geomagnetic equator.

At 2158 UTC, 2 January, OA4TT (Canete, Peru) worked VK4DDC, followed a minute later by E51EME (BG80CT) on Rarotonga, Cook Islands. Six metres was open between VK and ZL, and in the half hour after 2200 UT, OA4TT worked VK2OT, ZL2TPY, ZL1NX, ZL3ADT, VK4WTN, VK2FLR, VK4HJ and VK4CZ. Distances extended from 8870 km (E51EME) to 13,239 km (VK4WTN). The time difference between OA4TT and eastern VK is nine hours – morning in VK (and ZL) and afternoon in Peru. So the event fits the 'classic' summer solstice short path (SSSP), or 'extreme range' Es, propagation characteristics.

The event provided an opportunity to characterise the OA4TT/VK/ZL path, based on the methodology I have detailed online in a posting titled 'Signal Strengths of VHF sporadic E propagation' (on the VKLogger Forum at Band by Band>Propagation & Solar Cycle News). This enables the determination of total transmission path losses for Es propagation.

Over the South Pacific end of these paths, Es provided the extra skip between the southern equatorial ionospheric anomaly (EIA). The ionosonde on Niue Island lies pretty much beneath the southern EIA. The combination of foF2 values and height of the F2 layer over the period the contacts occurred created the necessary conditions to

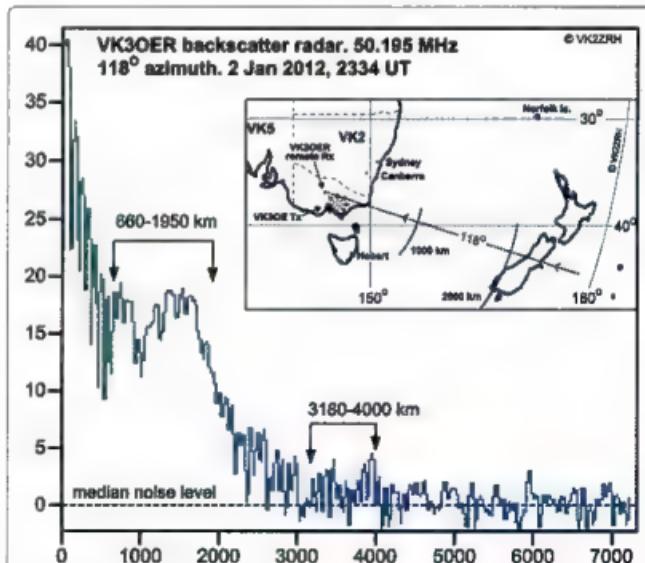


Figure 3: Bistatic backscatter chirp radar sounding by VK3OE during the great trans-Pacific six metre opening.

For the exercise, my friend of 40 years, Mike VK2FLR, provided key details of his contact and station equipment. OA4TT's QRZ.com pages provided details of his station. IPS ionosondes at the VK end, together with a backscatter radar sounding [2] by VK3OER, in Figure 3 below, added useful information.

The VK2FLR-OA4TT path is 12,817 km long. The usual rule-of-thumb would indicate six-hop Es at 2137 km per hop, close to the limiting case maximum (zero ray path elevation angle) [3]. I analysed the likely path characteristics based on ionograms at the western end, showing sufficient Es electron density, with the height at 99 km. The backscatter sounding from VK3OER, in Figure 4, shows contiguous multi-hop Es from 660 km out to 4000 km, east of ZL. From VK/ZL to Peru, across the south pacific region, Es events most often occur at 105 km height, based on studies of radio occultation of GPS signals. The resultant propagation analysis is shown in Figure 4. It's eight hops, sporadic E all the way! A check against the passage of the southern ElA showed that the last hop or two closest to OA4TT were quite unlikely to be F2 skip as electron densities that late in the day near South America would not have supported 50 MHz.

The VK2FLR-OA4TT transmission path loss analysis gave a S/N ratio for OA4TT at VK2FLR of 18 dB, confirmed by VK2FLR (quote: 'S3 by ear' - Mike's an experienced operator). Could it have been even more hops? The analysis gave a negative

SNR! Could it have been more hops? At ray path elevation angles best suited to the antenna elevation radiation angles at each end, the path would be 12 hops, but losses reduce the SNR well below that reported.

OA4TT runs 1 kW to an eight element Yagi at 20 metres height, while VK2FLR was running around 100 W to a three element Yagi at 10 metres height at his inner-city location of Glebe Point, in Sydney.

Amazing stuff! Roger Harrison VK2ZRH

[1] 'Afternoon Transequatorial VHF Propagation', Roger Harrison VK2ZRH, at <http://home.iprimus.com.au/toddemsile/aTEP-Harrison.htm>

[2] 'A Bistatic Backscatter Chirp Radar for Amateur Radio Use', Andrew Martin VK3OE, DUBUS 2/2010.

[3] 'On Sporadic E, VHF Propagation, MUFs and Petit Chordal Hop', Roger Harrison VK2ZRH, DUBUS 2/2011.

Thanks Roger, great report.

1st January, as well as the W opening in the afternoon a good opening from VK5 to JA1, 2 and 3.

On the morning of 3rd January many VK3 and VK5s worked both TI5XP & TI7/N5BEK Costa Rica with Steve VK3ZAZ, Garry VK5ZK and John VK5PO also working HP3TA Panama.

On 4th January, a good opening to northern Japan with many VK3, VK5 and VK7s working JA8GFB and JA8CIC.

On 8th January, Brian VK4DDC worked HP3TA CW 519 and Tony

3D2AG/p Rotuma Island worked into VK2 and VK4.

On 15th January, Frank VK7DX had a good early evening opening with contacts into VK4, VK5 and VK6 and Mark VK8MS in Darwin, plus ZL.

On 16th January, an early opening from VK6 to VK5, with VK6RO working Col VK5RO and Brian VK5BC/p.

On 17th January, an opening from JA to VK2 with John VK2BHO and Mike VK2ZQ working several JAs. Mike reported working JR2HCB, JA2KRE, JA2NBV, JA3APL and JA9RKU on 50.130. John VK7XX also worked several JAs.

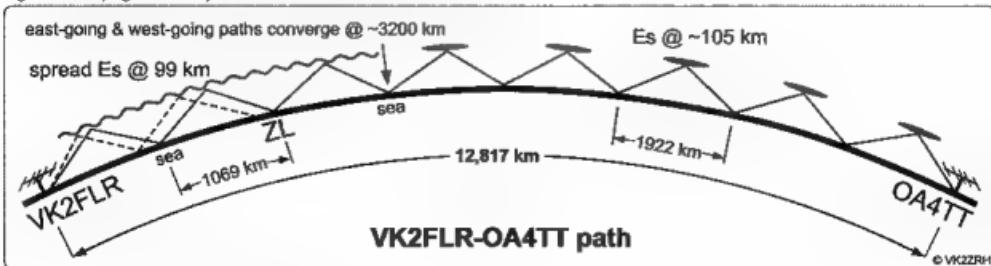
On 23rd January, a good Es from VK5 to VK2 and VK4 in the morning and VK5 to VK6 in the afternoon. ZL3NW worked three stations in W4 and W5 in the morning.

On 24th January, Steve VK3ZAZ started to hear signals from ZL (Es) in the morning and after calling CQ was answered by a K4MM and completed a CW contact over a distance of 15868 km. Steve went on to work several Ws and XE1FAA, all in CW.

On 27th January, a late afternoon opening from VK5 to JA with Garry VK5ZK and Brian VK5BC/p working JR2HCB.

Andy VK6OX reports the following from VK6: December last year saw a continuation of Sporadic E openings to the East, with contacts made on 20 days to VK2, 3, 4, 5 and 7 plus ZL. Openings of note included a good afternoon session to JA on 7th December spanning 0800Z - 1000Z. JA areas 2, 3, 6 and 9 were worked.

Figure 4: Propagation analysis of the VK2FLR-OA4TT contact.



On 21st December several of us here in Perth were fortunate enough to hear Bob E51EME from the South Cook Islands calling CQ on 50.1106 but conditions were marginal so he wasn't worked. However on the 30th I finally managed to work him on CW at 0235Z. Distance between stations 8293 km, a fair haul!

On to January 2012, where Es conditions started to taper off, with just the odd opening to the eastern states with only moderate signals. New Year's Day provided some excitement with FK8IA and 3D2AG/P Rotuma Island both worked. Bob E51EME was again worked on two occasions: 2nd January 0857Z and 21st January 0710Z, the latter QSO via JT65A.

John VK6JJ has kindly sent me a summary of his activities over the past two months. Please see table on next column.

Please send any six metre information to Brian VK5BC at [briancleland@bigpond.com](mailto:briancleland@bigpond.com)

13.12.11	0726	50	SSB	VK5PO	59	59	John
20.12.11	0436	50	SSB	VK5BC	59	59	Brian
27.12.11	0614	50	CW	ZL3NW	559	539	
27.12.11	0637	50	SSB	ZL3ADT	53	44	Ross
31.12.11	0245	50	SSB	VK2HC	57	57	Peter
31.12.11	0249	50	SSB	VK4KLC	57	57	Ron
31.12.11	0315	50	CW	VK2BJ	559	559	Barry
31.12.11	0319	50	CW	VK4WTN	578	579	Wayne
31.12.11	0322	50	CW	VK2OT	569	569	Mike
31.12.11	0335	50	SSB	VK2OT	58	58	Mike
31.12.11	0356	50	SSB	VK2IZI	59	59	Neil
31.12.11	0457	50	SSB	VK4AMG	57	57	George
31.12.11	0517	50	CW	VK4WM	589	599	Wade
31.12.11	0613	50	SSB	VK4IO	55	55	Phil
31.12.11	0724	50	SSB	VK4WQ	59	59	George
31.12.11	0739	50	SSB	VK4KR	53	44	Errol
01.01.12	0658	50	CW	3D2AG/p	559	559	
01.01.12	0708	50	SSB	VK4VN	59	59	Steve
02.01.12	0430	50	CW	VK5PO	559	559	John
02.01.12	0640	50	SSB	VK5AYD	59	59	
02.01.12	0645	50	SSB	VK8MS	59	58	Mark
02.01.12	0734	50	SSB	VK6ARW	59	53	Rex
02.01.12	0843	50	SSB	VKSNSY	59	59	Roger
08.01.12	0610	50	SSB	9V1TT	55	55	Andrew
10.01.12	0340	50	SSB	VK4HJ	57	57	Chris
10.01.12	0344	50	SSB	VK4AHW	57	57	Harvey
10.01.12	0418	50	SSB	VK4VN	56	56	Steve
10.01.12	0447	50	SSB	VK4WDM	56	59	Lost in QSB
11.01.12	0149	50	SSB	ZL2WHA	52	41	
11.01.12	0232	50	SSB	ZL2WHO	55	42	Mark
11.01.12	0300	50	SSB	ZL3NW	55	55	Rod
13.01.12	0205	50	SSB	VK4HJ	59	59	Chris
13.01.12	0305	50	SSB	VK6KP	59	59	Rod
25.01.12	0310	50	SSB	VK5BC	55	55	Brian
29.01.12	0153	50	SSB	VKSBC/P	57	57	Brian

## K5B – The Bataan Memorial Death March Marathon

The Mesilla Valley Radio Club of Las Cruces, New Mexico will be operating special events station K5B on March 25, 2012 in conjunction with the 23rd annual Bataan Memorial Death March Marathon held annually at the White Sands Missile Range. K5B will operate from 1000Z to 2300Z.

K5B will be operating as near as possible to 21.337, 14.330, 7.225, and 3.893 MHz as band conditions permit. Last year, K5B spent most of its time on twenty metres. A commemorative QSL card for the

event will be available by request. Send your QSL card confirming your contact with a business sized self-addressed stamped envelope [please use a Forever stamp]. Please write 'K5B' in big letters on the lower, left hand corner of the outer envelope.

The K5B mailing address is:  
Special Events Station K5B  
c/o Mesilla Valley Radio Club  
P. O. Box 1443  
Las Cruces, NM 88004-1443

All QSL requests must be received by Friday, April 20. Please allow

four to six weeks from that date to receive the K5B QSL card.

DX stations wanting our card should send their QSL to us. If you don't send an SASE with U.S. postage, we will send it to you via the ARRL Outgoing QSL bureau.

We cannot accept cash due to event policy. So please do not send us money as we will just have to return it to you.

The URL for the event is <http://www.bataanmarch.com>. The URL for K5B is <http://www.n5bl.org/bataan>.

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Copies of Radio Weekly magazine. The WIA Archive is seeking copies of Radio Weekly for copying and/or adding to the WIA Archive's shelves. Little is known about this magazine. The WIA holds two copies only Volume 1, Number 1 and Volume 2, Number 2. They contain about 36 pages and issues included articles of general radio interest in addition to the odd experimental article.

The magazine was published in Melbourne commencing in February 1925 and claimed a circulation of 25000! For those who have responded to previous requests for copies of early magazines, thank you. We are gradually building up our collection of important Australian magazines which will be available to future researchers. Please contact Peter VK3RV via email [vk3rv@wia.org.au](mailto:vk3rv@wia.org.au) or c/o the National Office in Bayswater if you can help us locate copies of this magazine.

## FOR SALE - NSW

Yaeu FT-1000MP and MD-1 microphone, S/N 8J330124, \$1400 O.N.O. Contact Scott VK2LS on mobile 0427 544 104.

## WANTED - SA

Misplaced book - believed loaned to another VK5: "Seventy years of radio tubes & valves" by John Stokes. Return appreciated ASAP. Steve Mahony VK5AIM, QTHR, (08) 8255 7397.



## WANTED - NATIONAL

Early copies of QTC magazine.

The WIA Archive is seeking early copies of QTC magazine for copying and/or adding to the WIA Archive's shelves.

QTC was published in Queensland and claimed to be the first solely Amateur Wireless magazine in Australia and second in the British Empire!

The format was duplicated foolscap pages stapled, with a light blue/grey front cover. QTC was published in the late 1920s/early 1930s, ceasing in November 1931; VK4LG was the dedicated editor. There was a later version in Queensland. We are presently interested in the early editions only.

Please contact Peter VK3RV via email [vk3rv@wia.org.au](mailto:vk3rv@wia.org.au) or c/o the National Office in Bayswater if you can help us locate this important part of our history.

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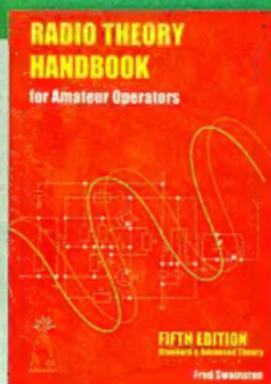
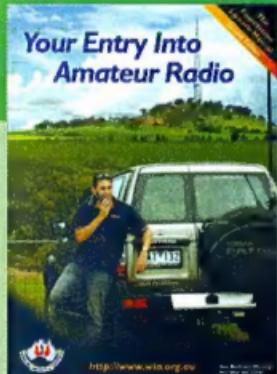
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Email: [vk8advisory@wia.org.au](mailto:vk8advisory@wia.org.au)  
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